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ABSTRACT

This document is intended to help construction carpentry instructors in the State of Truk, Truk, Federated States of Micronesia, to prepare their senior high school students uniformly to design and build residential structures capable of withstanding typhoons. Because of the threat of typhoons, the carpentry curriculum contained in the guide has a strong masonry construction component. For each grade (9th through 12th), the guide provides a course description, course goal, course objectives, and curriculum outline consisting of unit titles and a subject matter topic list for each. In addition, the guide lists for every unit a major student performance objective, instructional content, cognitive and performance activities, and instructional aids and methods. For the 9th and 10th grades, the units are shop and construction safety, common carpentry hand tools, mathematics for carpenters, plan reading and interpretation, building materials and hardware, and (for ninth grade only) joinery. For the 11th grade, the units are building layout and framing. For the 12th grade, the units are orientation to construction and carpentry, power tools and equipment, cement and concrete, framing, finishing carpentry, and estimating. A 40-item bibliography completes the document. (CML)

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CURRICULUM GUIDE

CONSTRUCTION CARPENTRY
Secondary Schools

This activity was supported by a grant from the State of Truk Government and executed by the College of Education, University of Hawaii at Manoa. However, opinions expressed herein do not necessarily reflect the position or policy of the Truk State Government and the College of Education and therefore no official endorsement should be inferred.

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August 1989

FOREWARD

This guide was developed to assist the construction carpentry instructor in planning instructional programs to prepare students for varying levels of entry-level skills with which they choose to leave the program. There are four levels to this program each of which is a prerequisite of the other and must be taken accordingly.

Construction Carpentry is one of the many programs which make up the vocational education in the State of Truk. These programs provide an alternative track for those students who prefer working with their hands to earn a living, and therefore were never intended, nor should they be treated as a dumping ground for remedial or potential drop out students. This however does not lessen the fact that all vocational students need strong basic skills in order to be successful in their chosen field.

The guide provides the rationale, content description, goals and objectives of each level; the specific performance objectives and recommended aids and teaching methods. It is hoped that this information will enable each instructor to better prepare their lesson plans and delivery methods.

Constructive comments and recommendations will be greatly appreciated. This should be forwarded to either the Truk State Supervisor for Vocational Education or the University of Hawaii's College of Education.

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This curriculum guide for construction carpentry is the result of the cooperative efforts of many people in the State of Truk Department of Education, the University of Hawaii at Manoa College of Education, the staff of Western Curriculum Coordination Center (WCCC) and Pacific Basin Bilingual Education Personnel Development Project (PB-BEPD). Experienced teachers in all Truk secondary schools contributed toward the development of this guide. The following persons are awknowledged as participants, consultants, evaluators, and support staff.

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INTRODUCTION

Fed by the twin forces of population increase and technological advances a building boom in the Federated States of Micronessia and especially the State of Truk is inevitable. Today the need in the State of Truk is for the construction of permanent structures that will stand up to typhoons (like the one in April of 1988). The strength and permanence calls for skilled craftsmen to design and build residential structures that will withstand the force of a typhoon. A high school vocational program in construction carpentry with a strong masonry construction component is essential to the development of these skills.

The purpose of this curriculum guide is to ensure that students enrolling in construction carpentry program, regardless of their school's location, will be taught uniform skills. Furthermore, the State of Truk has only one high school (Truk High School) which means students not taught uniformly during their junior high school years will pose problems to the already understaffed construction carpentry department at the 11th and 12th grade level.

This curriculum guide is a result of the dedication and persistence of the State Supervisor for Vocational Education, Mr. Masasinge Eis. The many years of frustration did not deter or stop him from lobbying for funding. The persistence paid off when the Truk Curriculum Development Project was finally funded and the contract signed on May 1988. On the opening day ceremony for the summer workshop on June 12, 1989, the then Acting State Director of Education Mr. Kangichy Welle, awknowledged Mr. Eis efforts by saying, "Masasinge is one of those few people who can really make things happen and all educational system personnel should emulate him." He truly deserves the honor.

Finally, this curriculum guide and all other curriculum guides are dedicated to the teachers in the classrooms, without whom the teaching and learning cannot take place. It is hoped that the construction carpentry teachers in Truk's secondary schools will find this product useful, for it is for their sake that many people have spent so many hours preparing this guide.

CONSTRUCTION CARPENTRY

9TH GRADE

A. COURSE TITLE: CARPENTRY I

B. COURSE DESCRIPTION

This is a one semester course designed for the 9th grade (Freshmen) level. It is a study of the fundamental concepts of woodworking, safety, tools, mathematics, plan reading and materials and how each fit into the field of construction carpentry. Utilizing shop work, demonstrations, field trips, resource speakers and class lectures the students will get the feel of what construction carpentry is all about.

C. GOAL

The goal of this course is to develop interest and introduce students to the field of construction carpentry and the various opportunities of a career in this broad field.

D. Course Objectives

1. Demonstrate habits which are conducive to learning.
2. Explain the importance of practicing safe working habits.
3. Specify the tools most commonly used in the field of carpentry.
4. Understand basic rules relating to blueprint reading and interpretation.
5. Learn basic mathematics required in the field of carpentry.
6. Demonstrate competence in the safe use of carpentry tools which will enable them to advanced to the next course level.

E. CURRICULUM OUTLINE

Unit I: Shop and Construction Safety

A. Construction Safety
B. Shop Safety
C. Scaffolds and Ladders
D. Protective Clothing and Equipment
E. Protective Guards
F. Roof Brackets
G. Material Handling
H. Safe Lifting
I. First Aid
J. Color Code
K. Fire Safety
L. Hand Tools and Power Equipment Safety
M. Safety Pledge
N. Safety Tests

Unit II: Common Carpentry Hand Tools

A. Common Hand Tools

1. Measuring, Layout and Testing Tools
2. Leveling Tools
3. Cutting Tools
4. Smoothing Tools
5. Boring Tools
6. Holding Tools
7. Assembling Tools
8. Wrecking Tools
9. Sharpening Tools
10. Sharpening Stones

Unit III: Mathematics for Carpenters

A. Addition of Whole Numbers
B. Subtraction of Whole Numbers
C. Multiplication of Whole Numbers
D. Division of Whole Numbers
E. Addition of Common Fractions
F. Subtraction of Common Fractions
G. Multiplication of Common Fractions
H. Division of Common Fractions
I. Addition of Decimal Fractions
J. Subtraction of Decimal Fractions
K. Multiplication of Decimal Fractions
L. Division of Decimal Fractions
M. Expressing Common Fractions and Mixed Numbers as Decimals
N. Simple Percents and Percentages
O. Interest
P. Discounts

Unit IV: Plan Reading and Interpretation

A. Instruments
B. Lines

1. Construction Line
2. Border Line
3. Visible or Object Line
4. Hidden Line
5. Center Line
6. Break Line
7. Sectioning Line
8. Cutting Plane Line

C. Material Symbols
D. Door and Window Schedule
E. Plumbing Symbols

F. Electrical Symbols
G. Abbreviations
H. Kind of Drawings

Unit V: Building Materials and Hardware

A. Wood - Its Nature and Properties
B. Kind of Woods
C. Fine Furniture Woods
D. Sizes of Boards and Lumber
E. Plywood

1. Advantages
2. Kinds of Plywood Construction
3. Manufacture Plywood
4. Hardwood Plywood Grading
5. Working With Plywood

F. Hardboard and Particle Boards
G. Millwork and Molding
H. Fasteners and Fastening Tools

1. Nails and Nailing Tools
2. Screws
3. Hollow-Wall Fastening Device
4. Masonry Fasteners
5. Miter-Joint Fasteners

I. Hardware
J. Glass and Mirrors
K. Lumbers

Unit VI: Joinery

A. Fastening and Strengthening Joints

1. Dowels
2. Splines
3. Key
4. Glue Blocks
5. Corner Blocks

B. Types of Joints

1. Butt Joints
2. Edge Joints
3. Rabbet Joints
4. Dado Joints
5. Lap Joint
6. Miter Joints
7. Mortise-and-Tenon Joints
8. Dovetail Joints

UNIT I: Shop and Construction Safety

Major Objective: After completing this unit each student will be able to pass the safety test with 100 percent accuracy. They will also be able to work safely in the shop and be able to know what it takes to make a work environment safe for themselves and others.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to demonstrate the safety rules required for a safe working environment and conditions.	
A. Construction Safety	Student will be able to review the importance of safety and why it is important to follow safety regulations at all times	Lecture Handouts Post-Test
B. Shop safety	Student will be able to identify all the hazards in using all the shop equipment and all the safety rules one must follow while in the shop.	Feirer and Hutchings pp. 106 - 110 Post-Test
C. Scaffolds and Ladders	Student will demonstrate the importance of scaffolds and ladders and be able to construct them for shop use. Student will also be able to identify defective and unsafe scaffolds and ladders.	Handouts Shop Project Site Visitation Post-Test
D. Protective Clothing and Equipment	Student will be able to explain the purpose of protective clothing and will describe the proper use of such equipment. Student will also learn to store and keep the safety attires in good and safe conditions.	Handouts Lecture and Demonstration Catalogs Safety Clothing Chart Post-Test

E. Protective Guards	Student will explain the purpose of all safety guards and their importance to the safety and well being of each worker. Student will sign a pledge to the teacher to not remove guards while using any portable and stationary equipment.	Handouts Individual Equipment Safety Pledge Card Demonstration Post-Test
F. Roof Brackets	Student will discuss the importance of using roof brackets to safely install roofing materials. Student will be able to distinguish between safe and unsafe roofing work.	Handouts Lecture and Demonstration Site Visitation Assignments Construct Model Roof Brackets Post-Test
G. Material Handling	Student will be able to safely handle hazardous and flammable materials. Student will understand the unsafe practices of the past and will learn to do the job safely.	OSHA Hazardous Chart Nomenclature Chart Demonstration Post-Test
H. Safe Lifting	Student will practice the technique of safely lifting heavy objects by the use and support of their legs. Student will recognize that the "Macho" image years are long gone and they should take care of themselves.	Guest Speaker Lifting Demostration Reading on Ergonomics Body Chart Post-Test
I. First Aid	Student will be able to identify symptoms of an ill or injured person and will be able to provide immediate help while outside help is being sought. Student will learn to be calm and be on top of a situation at all times.	First Aid Chart Demonstration by Nurses Safety Procedures Class Practice Emergency Channels on CB's and Telephones Post-Test

J. Color Code	Student will be able to identify the different types of safety color codes and the significance of of each color. Student will also be able to explain what each color conveys on a job site.	OSHA Safety Color Codes Site Visitation Lecture Post-Test
K. Fire Safety	Student will be able to identify and distinguish the various types of fire and will be able to select the appropriate extinguishers for the fires.	Handouts on Fire Codes Shop Escape Route Guest Speaker from Truk Police and Fire Department Post-Test
L. Hand Tools and Power Equipment Safety	Student will practice using all hand tools and power equipment properly and safely.	Refer to Units on both Hand Tools and Power Equipment.
M. Safety Pledge	Student will discuss the purpose of a safety pledge and will sign one to signify that they are willing to abide by safety rules at all times.	Safety Pledge Nomenclature Chart
N. Safety Tests	Student will memorize and "must" pass all safety tests before they are permitted to use or operate any tools and equipment.	Tools and Equipments Safety Test.

UNIT II: Common Carpentry Hand Tools

Major Objective: After completing this unit the student should be able to name, identify, use and maintain the common hand tools used in the field of carpentry. The students will especially learn how to maintain the tools given their proximity to the ocean. The students will also review and follow the safe use of each of the hand tools as required by the manufacturers.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to use safely and properly maintain all common carpentry hand tools.	
A. Common Hand Tools	Student will use all common carpentry hand tools safely and will maintain the tools in good working condition.	Carpentry and Building Construction. John L. Feirer and Gilbert Hutchings (Author) Cabinetmaking and Millwork John L. Feirer (Author)
1. Measuring, Layout and Testing Tools	Student will utilize all measuring, layout and testing tools properly and safely. Student will demonstrate the use of the following tools: a. Folding Rule b. Steel Tape c. Combination Square d. Framing Square or Steel Square e. Dividers and Compass f. Sliding T-Bevel g. Scriber h. Butt gage	Feirer and Hutchings pp. 111 - 113 Cabinetmaking and Millwork pp. 228 - 229 Handouts Shop Projects Post-Test

2. Leveling Tools	Student will identify the correct use of these tools. The student will also learn to maintain and store leveling tools properly. a. Chalk Line b. Plumb Bob c. Line Level d. Torpedo Level e. Spirit Level f. Builder's Level and Transit g. Leveling Hose or Tubes	Feirer and Hutchings pp. 113 - 114 Cabinetmaking and Millwork p. 229 Handouts Shop Projects Field Practice Demonstration Post-Test
3. Cutting Tools	Student wil be able to identify and use all cutting tools properly and safely. Student will also learn to sharpen all cutting tools. a. Crosscut Saw b. Rip Saw c. Coping Saw d. Keywhole Saw e. Miter Box Saw f. Hacksaw g. Ryoba (Japanese saw) h. Wood Chisels i. Hatchet and Axes j. Utility Knife	Feirer and Hutchings pp. 114 - 115 Cabinetmaking and Millwork pp. 230 - 231 Stanley Tools Catalog Craftsman Tools Catalog Brookstone Tools Catalog Shop Project Individual Project Demonstration Post-Test
4. Smoothing Tools	Student will identify and use all smoothing tools properly. Student will be able to sharpen all smoothing tools and restore old ones to good working condition. a. Block Plane	Feirer and Hutchings pp. 116 - 117 Cabinetmaking and Millwork pp. 231 - 233 Stanley Tools Catalog Craftsman Tools Catalog Brookstone Tools Catalog

	b. Smoothing Plane c. Jack Plane d. Wood Rasps and Files e. Japanese Planes f. Abrasive Papers	Shop Project Individual Project Post-Test
5. Boring Tools	Student will be able identify and use all boring tools properly and safely. Student will also maintain the boring tools and sharpen auger and speed bits. a. Brace and Auger Bits b. Expansive Bits c. Hand Drill d. Spiral Drill	Feirer and Hutchings pp. 119 - 120 Cabinetmaking and Millwork pp. 234 - 235 Variou Tools Catalogs Shop Project Individual Project Post-Test
6. Holding Tools	Student will explain the purpose of and will be able to employ all types of holding tools. Student will also learn to devise his/her own holding tools for any given job. a. Vises b. C-Clamps c. Bar Clamps d. Saw Horse e. Channel-Lock Vises	Handouts Stanley Tools Catalog Craftsman Tools Catalog Demonstration Shop Work Home Made Devices Post-Test
7. Assembling Tools	Student will identify and will be able to employ all commonly used fastening tools. Student will also learn to maintain and keep tools in safe and good working conditions. a. Curved Claw Hammer	Feirer and Hutchings pp. 121 - 123 Cabinetmaking and Millwork pp. 236 - 237 Handouts Stanley Tools Catalog Brodhead and Garret Catalog Shop Project

	b. Straight Claw Hammer c. Stapler and Stapling gun d. Screwdriver (Flat, Phillips) e. Ratchet Screwdriver f. Adjustable Wrench g. Combination Pliers h. Nail Sets i. Open and Box-End Wrenches	Individual Project Demonstration Post-Test
8. Wrecking Tools	Student will list and will be able to use various types of wrecking tools properly and safely. a. Claw Bar b. Pry Bar c. Sledge Hammer d. Nail Puller e. Wrecking Bar	Handouts Stanley Tools Catalog Brodhead and Garret Cat. Craftsman Tools Catalog Shop Project Demonsration Post-Test
9. Sharpening Tools	Student will demonstrate the use of the various types of sharpening tools and devices. a. Oilstone b. Files c. Hand Grinder d. Sharpening Stones	Handouts Brookstone Tools Catalog Stanley Tools Catalog Shop Project Sharpening Exercises Post-Test

UNIT III: Mathematics for Carpenters.

Major Objective: After completing this introductory unit the students will be able to perform the basic practical mathematics problems for carpenters. Students will take this course as a pre-requisite for a math unit offered at the 10th grade level.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	After completing this unit the student will be able to perform basic problems in mathematics that will help in the trade and carpentry area. Student will specifically be able to perform the following:	
A. Addition of Whole Numbers	Student will perform addition of whole numbers as required by carpentry trade.	Mathematics for Carpenters Huth, Harry C. (1979) pp. 1 - 5 Classwork and Assignments Post-Test
B. Subtraction of Whole Numbers	Student will perform subtraction as required by carpentry trade.	Mathematics for Carpenters pp. 6 - 9 Classwork and Assignments Post-Test
C. Multiplication of Whole Numbers	Student will be able to multiply whole numbers as required by carpentry trade.	Mathematics for Carpenters pp. 10 - 13 Classwork and Assignments Post-Test

D. Division of Whole Numbers	Student will be able to divide whole numbers as required by carpentry trade.	Mathematics for Carpenters pp. 14 - 16 Classwork and Assignmensts Post-Test
E. Addition of Common Fractions	Student will be able to add fractions and measurements in fractions of inches, feet and yards.	Mathematics for Carpenters pp. 17 - 23 Classwork and Assignments Post-Test
F. Subtraction of Common Fractions	Student will be able to subtract fractions of measurements in fractions of inches, feet and yards.	Mathematics for Carpenters pp.24 - 28 Classwork and Assignments Post-Test
G. Multiplication of Common Fractions	Student will be able to multiply fractions of measurements in inches, feet and yards.	Mathematics for Carpenters pp. 29 - 32 Classwork and Assignments Post-Test
H. Division of Common Fractions	Student will be able to divide fractions of measurements in inches, feet and yards.	Mathematics for Carpenters pp. 33 - 37 Classwork and Assignmenst Post-Test
I. Addition of Decimal Fractions	Student will perform addition of decimals as applied in carpentry trade.	Mathematics for Carpenters pp. 43 - 47 Classwork and Assignments Post-Test
J. Subtraction of Decimal Fractions	Student will be able to perform subtraction of decimals as applied in carpentry trade.	Mathematics for Carpenters pp. 48 - 51 Classwork and Assignments Post-Test

K. Multiplication of Decimal Fractions	Student will be able to perform multiplication of decimals as applied in the carpentry trade.	Mathematics for Carpenters pp. 52 - 54 Classwork and Assignments Post-Test
L. Division of Decimal Fractions	Student will be able to illustrate the division of decimals as required by carpentry trade.	Mathematics for Carpenters pp. 55 - 57 Classwork and Assignments Post-Test
M. Expressing Common Fractions and Mixed Numbers as Decimals	Student will be able to change fractions into decimals as applied by carpentry trade.	Mathematics for Carpenters pp. 58 - 64 Classwork and Assignments Post-Test
N. Simple Percent and Percentage	Student will be able to describe and use simple percentage methods in carpentry work.	Mathematics for Carpenters pp. 65 - 70 Classwork and Assignments Post-Test
O. Interest	Student will be able to interpret and apply the principles of interest as required by carpentry trade.	Mathematics for Carpenters pp. 71 - 74 Classwork and Assignments Post-Test
P. Discounts	Student will be able to solve discount problems that relate to carpentry trade.	Mathematics for Carpenters pp. 75 - 79 Classwork and Assignments Post-Test

UNIT IV: Plan Reading and Interpretation

Major Objective: After completing this unit the student will be able to read and interpret working drawings as required by carpentry trade. Student will also master the use of architectural and engineering scales.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completion of this unit the student will be able to memorize the function and use of all drawing instruments and symbols.	
A. Instruments	Student will identify the various drawing instruments and will maintain them properly.	Drawing Tools Chart Demonstration Visitation to Architect Firm Feirer and Hutchings pp. 34 - 35 Post-Test
B. Lines	Student will list the names and purposes of all drawing lines and will use them in drawing projects and/or read them on the prints. a. Construction Line b. Border Line c. Visible or Object Line d. Hidden Line e. Center Line f. Break Line g. Sectioning Line h. Cutting Plane Lines	Cabinetmaking and Millwork John L. Feirer, 1982. pp. 186 - 188 Classwork and Drawings Blueprints Carpentry and Building Construction Feirer and Hutchings, 1981 p. 36 Post-Test

C. Material Symbols	Student will identify the basic symbols used in drawings and will be able to incorporate them in drawing or be able to read and interpret them as they appear on regular working drawings.	Cabinetmaking and Millwork p. 189 Carpentry and Building Construction. Feirer and Hutchings p. 36 Post-Test
D. Door and Window Symbols	Student will review the door and window symbols and will read them correctly as they appear on the regular blueprints and working drawings.	Cabinetmaking and Millwork p. 190 Feirer and Hutchings p. 37 Classwork and Assignments Post-Test
E. Plumbing Symbols	Student will describe the plumbing symbols and will be able to read them correctly as they appear on blueprints and/or working drawings.	Cabinetmaking and Millwork p. 190 Feirer and Hutchings p. 38 Classwork and Assignments Post-Test
F. Electrical Symbols	Student will identify the electrical symbols and will read them correctly as they appear on regular blueprints and working drawings.	Cabinetmaking and Millwork p. 190 Feirer and Hutchings p. 37 Classwork and Assignments Post-Test
G. Abbreviations	Student will be able to memorize all abbreviations used in blueprints and working drawings.	Cabinetmaking and Millwork p. 191 Post-Test Feirer and Hutchings pp. 73 - 74

H. Kinds of Drawings	Student will be able to distinguish the four different types of drawing and will describe the purpose of each kind.	Cabinetmaking and Millwork pp. 191 - 200 Classwork and Assignments Various Drawings Post-Test

UNIT V: Building Materials and Hardware

Major Objective: After completing this unit the student will be able to distinguish the various building materials used in the field of carpentry. They will be able to identify all materials available to the carpenters in the State of Truk and Federated States of Micronesia in general.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	After completing this unit the student will be able to identify the various types, styles and sizes of building materials available in their home state, Truk.	
A. Wood - Its Nature and Properties	Student will distinguish the various types and properties of wood. Special emphasis will be placed on the study of local wood. The following characteristics of wood will be learned: a. Parts of a Tree (English and Local Names) b. Specific Gravity c. Cell Structure (Local vs Import) d. Growth Rings e. Softwoods and Hardwoods f. Cutting Methods (Sawmill and Chainsaw) g. Shrinkage of Lumber h. Lumber Defects	Cabinetmaking and Millwork John L. Feirer, Author (1982) pp. 66 - 80 Reading Assignments Science Lectures Visit to Local Lumberyard Class Project Making a Nomenclature Chart of Local Trees used in Building Residential Structures Post-Test Tension and Compression Test Testing Equipment are Available. Post-Test

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B. Kinds of Wood	Student will list and record the various types of wood being imported to Truk from the United States and the Phillipines. Student will also identify the local wood which can substitute for the imported woods from other parts of the world.	Cabinetmaking and Millwork pp. 80 - 100 Visit to Hardware Store Import - Export Statistics Guest Lecturer from the Local Community. Individual Projects Relating to the types of wood. Post-Test
C. Fine Furniture Wood	Student will be able to distinguish the various types of wood which are considered the best in making furnitures. Emphasis will be placed on local wood which can replace the imports.	Cabinetmaking and Millwork pp. 101 - 116 Visit to Lumberyard Visitation to Small Industry Special Project Working Drawings Containing Furniture Specifications. Post-Test
D. Sizes of Boards and Lumber	Student will be able to determine the size of dimensioned boards and lumber by sight. Student will know the difference between nominal and actual size.	Lecture and Handouts Visit to Lumberyard Reading Materials Post-Test
E. Plywood	Student will learn the history of plywood and will be able to apply plywood in various type of carpentry jobs.	Cabinetmaking and Millwork pp. 116 - 128 Reading Assignments Post-Test
1. Advantages of Plywood	Student will be able to list the advantages of plywood as building material.	Cabinetmaking and Millwork p. 117 Post-Test

2. Kinds of Plywood Construction	Student will be able to describe two different types of plywood namely: a. Veneer-Core b. Lumber-Core	Cabinetmaking and Millwork pp. 118 - 119 Reading Assignments Site Visitation Post-Test
3. Manufacture of Plywood	Student will be able review the the different steps of plywood production starting from the tree harvest to the finished product.	Cabinetmaking and Millwork pp. 120 - 123 Reading Assignments Post-Test A Film Showing the Manucfacture of Plywood if such a Film is Available.
4. Hardwood Plywood Grading	Student will describe the different types of plywood grading and will be able to distinguish the grades based on the following: a. Grades as Shown b. Types of Bonding c. Dimensions d. Thickness e. Molded Plywood f. Appearance of Hardwood Veneers	Cabinetmaking and Millwork pp. 123 - 125 Reading Assignments Nomenclature Chart of Various Types of Plywood. Site Visitation Post-Test
5. Working with Plywood	Student will recall and list different ways to use plywood namely the following: a. Storage b. Cutting c. Selecting Plywood for a Job d. Planing Edges	Cabinetmaking and Millwork pp. 127 - 129 Various Shop Projects to be assigned by the Instructor Working Drawings School Shop Magazine Post-Test

	e. Treating Edges f. Using Nails and Screws g. Drilling and Boring h. Selecting Corner Joints i. Protecting the Face Veneer j. Sanding k. Gluing l. Removing Nails	
F. Hardboard and Particle Board	Student will be able to describe how particle and hardboard are made and the different methods of using them for carpentry projects.	Cabinetmaking and Millwork pp. 129 - 131 Various Shop Projects Post-Test
G. Millwork and Molding	Student will explain various types of millwork and molding using imports as well as locally produced materials.	Cabinetmaking and Millwork pp. 139 - 147 Shop Projects Various Magazines Post-Test
H. Fasteners and Fastening Tools	Student will be able to use various fastening materials and devices to bond different objects and parts together.	Cabinetmaking and Millwork pp. 147 - 162 Shop Exercises Post-Test
1. Nails and Nailing Tools	Student will be able to describe different types of nails and the various applications.	Cabinetmaking and Millwork pp. 148 - 150 Shop Exercises Nomenclature Chart Post-Test
2. Screws	Student will know the names and sizes of various types of screws as well as the different jobs requiring screws. Student will be to use each tool required for the installation of screwss.	Cabinetmaking and Millwork pp. 151 - 158 Shop Exercises Nomenclature Chart Post-Test

3. Hollow-Wall Fastening Device	Student will list and identify the name, as well as the proper and safe uses of devices needed to fasten objects and hardware to hollow-walled structure.	Cabinetmaking and Millwork pp. 158 - 160 Shop Exercises Nomenclature Chart Post-Test
4. Masonry Fasteners	Student will identify the various masonry fasteners and will be able to use each fastener properly and safely.	Cabinetmaking and Millwork pp. 160 - 161 Shop Exercises Post-Test
5. Miter-Joint Fasteners	Student will name the various miter-joint fastener and will be able to use each fastener properly and safely.	Cabinetmaking and Millwork pp. 161 - 162 Shop Exercises Post-Test
I. Hardware	Student will illustrate how to use the cabinetmaking and millwork hardware and will be able to install each.	Cabinetmaking and Millwork pp. 162 - 166 Shop Exercises Nomenclature Chart Handouts Post-Test
J. Glass and Mirrors	Student will name and describe all materials made out of glass and will be able to use them safely in a carpentry job.	Cabinetmaking and Millwork pp. 166 - 172 Shop Exercises Demonstration Post-Test
K. Lumber	Student will recall how to properly order lumber by both lineal feet and board-feet. (Also refer to the math section on board-feet)	Cabinetmaking and Millwork pp. 174 - 185 Visit to Lumberyard Shop Project Post-Test

UNIT VI: Joinery

Major Objective: After completing this unit the student will be able to identify the various types of joints being used in the field of carpentry. Furthermore, the student will be able to construct the various types of joints and to know what types of jobs require such joints.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completion of this unit the student will be able to put together all the wood joints and will be able to use them in shop projects	
A. Fastening and Strengthening Joints	Student will know all different types of devices used to strengthen wood joints.	Cabinetmaking and Millwork John L. Feirer, Second Ed. Revised, 1982. pp. 507 - 516 Post-Test
1. Dowels	Student will be able to use dowels to reinforce wood joints.	Cabinetmaking and Millwork pp. 509 - 512 Shop Project Post-Test
2. Splines	Student will be able to use splines to strengthen wood joints.	Cabinetmaking and Millwork pp. 512 - 515 Shop Project Post-Test
3. Key	Student will apply key to hold and to strengthen wood joints.	Cabinetmaking and Millwork p. 515 Shop Project Post-Test

4. Glue Blocks	Student will be able to use glue blocks to hold and to strengthen wood joints.	Cabinetmaking and Millwork p. 515 Shop Project Post-Test
5. Corner Blocks	Student will use corner blocks to hold and reinforce wood joints.	Cabinetmaking and Millwork p. 515 Shop Project Post-Test
B. Kinds of Joints	Student will identify, name and apply all types of wood joints.	Cabinetmaking and Millwork pp. 517 - 533
1. Butt Joints	Student will be able to construct the different types of butt joints: a. Simple Butt Joint b. Flat Butt Joint c. Doweled Butt Joint d. Corner Butt Joint e. Frame Butt with Dowels f. Middle-Rail Butt with Dowels	Cabinetmaking and Millwork pp. 517 - 518 Reading Assignments Shop Projects Nomenclature Chart Project Specification Post-Test
2. Edge Joints	Student will be able to construct the different types of edge joints: a. Butt or Plain Edge b. Dowel Edge c. Spline Edge d. Tongue and Groove e. Rabbet Edge f. Milled or Shaped Edge	Cabinetmaking and Millwork pp. 518 - 521 Reading Assignments Shop Projects Nomenclature Chart Project Specification Post-Test
3. Rabbet Joints	Student will be able to assemble the different types of rabbet joints:	Cabinetmaking and Millwork pp. 521 - 523 Reading Assignments

	a. Back-Panel Rabbet Joint b. Plain Rabbet Joint	Shop Projects Nomenclature Chart Project Specification Post-Test
4. Dado Joints	Student will be able to construct the different types of dado joints: a. Simple Dado Joint b. Stop or Blind Dado Joint c. Corner Dado Joint d. Rabbet and Dado Joint e. Dado and Tenon Joint f. Dado Box Corner g. Half-Dovetail Dado Joint h. Full-Dovetail Dado Joint	Cabinetmaking and Millwork pp. 523 - 524 Reading Assignments Shop Projects Nomenclature Chart Project Specification
5. Lap Joints	Student will be able to assemble the different types of lap joints: a. Cross Lap b. Edge Cross Lap c. Middle Lap or T-Trap d. Dovetail Lap e. End Lap	Cabinetmaking and Millwork pp. 524 - 525 Reading Assignments Shop Projects Nomenclature Chart Project Specification
6. Miter Joints	Student will be able to construct the different types of miter joints: a. Flat or On Edge b. Blind-Spline Miter c. Polygon Miters d. Compound Miter or Hopper Joint e. Miter-with-Rabbet Joint f. Lock Miter g. Miter-with-end-lap Joint	Cabinetmaking and Millwork pp. 525 - 528 Reading Assignments Shop Projects Nomenclature Chart Project Specification

7. Mortise-and-Tenon Joints	Student will construct and explain the use of the different types of mortise-and-tenon joints: a. Blind or Simple Mortise and Tenon b. Haunched Mortise-and-Tenon Joint c. Concealed Haunched Mortise-and-Tenon Joint d. Open Mortise-and-Tenon Joint e. Stub Mortise-and-Tenon joint	Cabinetmaking and Millwork pp. 529 - 530 Shop Projects Reading Assignments Nomenclature Chart Project Specification
8. Dovetail Joints	Student will explain and assemble the different types of dovetail joints: a. Multiple Dovetail b. Stopped-Lap Dovetail	Cabinetmaking and Millwork pp. 531 - 533 Reading Assignments Shop Projects Project Specification

CONSTRUCTION CARPENTRY

10TH GRADE

A. COURSE TITLE: CARPENTRY II

B. COURSE DESCRIPTION

This is a one year course that will enable the student to learn about the complex field of construction carpentry. The course reviews safety practices the use of handtools, mathematics for carpenters, plan reading and specification interpretation as well as thorough knowledge of all contruction related materials.

C. GOAL

The goals of this course are to introduce the student to the world of construction carpentry and the various opportunities of a career in this broad field. The completion of this course also enables students to advance to Carpentry III which is offered in the junior year level.

D. COURSE OBJECTIVES

1. Appraise the opportunities of a trade in construction carpentry and its requirements for entry level employment.

2. Demonstrate habits which are conducive to learning and living.

3. Explain the importance of practicing safe working habits and pass all the required shop safety tests.

4. Read and interpret working drawings and blueprints for both residential structures and shop projects.

5. Explain and discuss the process in which all construction materials are processed and delivered to State of Truk.

6. Solve construction mathematical problems using carpentry mathematics.

7. Explain and describe the sources of all construction materials being used in the State of Truk.

E. CURRICULUM OUTLINE

Unit I: Shop and Construction Safety

A. Construction Safety
B. Shop Safety
C. Scaffolds and Ladders
D. Protective Clothing and Equipment
E. Protective Guards

F. Roof Brackets
G. Material Handling
H. Safe Lifting
I. First Aid
J. Color Code
K. Fire Safety
L. Hand Tools and Power Equipment Safety
M. Safety Pledge
N. Safety Tests

Unit II: Mathematics for Carpenters

A. Linear Measure
B. Square Measure
C. Board Measure
D. Volume Measurement - Cubes and Rectangular Solids
E. Weight Measure
F. Ratio and Proportion
G. Powers and Roots
H. The Framing Square
I. Surface Measurement - Triangles
J. Surface Measurement - Irregular Figures
K. Surface Measurement - Circles
L. Volume Measurement - Cylinders

Unit III: Plan Reading and Interpretation

A. Architectural Working Drawings

1. Structural Members
2. Horizontal Members
3. Roof Members
4. Flooring
5. Sheathing, Siding and Roofing
6. Utilities
7. Finishing and Painting

B. Principles of Construction Drawing

1. Plans
2. Elevations
3. Framing Plans
4. Sectional Views
5. Detail Drawings
6. Dimensioning Working Drawings
7. Notes and Specifications
8. Bill of Materials

Unit IV: Building Materials and Hardware

A. Wood - Its Nature and Properties
B. Kind of Woods
C. Fine Furniture Woods
D. Sizes of Boards and Lumbers
E. Plywood

1. Advantages
2. Kinds of Plywood Construction
3. Manufacture Plywood
4. Hardwood Plywood Grading
5. Working With Plywood

F. Hardboard and Particle Boards
G. Millwork and Molding
H. Fasteners and Fastening Tools

1. Nails and Nailing Tools
2. Screws
3. Hollow-Wall Fastening Device
4. Masonry Fasteners
5. Miter-Joint Fasteners

I. Hardware
J. Glass and Mirrors
K. Lumbers

UNIT I: Shop and Construction Safety (Review)

Major Objective: After completing this unit each student will be able to pass the safety test with 100 percent accuracy. They will also be able to work safely in the shop and be able to know what it takes to make a work environment safe for themselves and others.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to demonstrate the safety rules required for a safe working environment and conditions.	
A. Construction Safety	Student will be able to review the importance of safety and why it is important to follow safety regulations at all times	Lecture Handouts Post-Test
B. Shop safety	Student will be able to identify all the hazards involved in using all shop equipment and all the safety rules one must follow in the shop.	Feirer and Hutchings pp. 106 - 110 Post-Test
C. Scaffolds and Ladders	Student will demonstrate the importance of scaffolds and ladders and be able to construct them for shop use. Student will also be able to identify defective and unsafe scaffolds and ladders.	Handouts Shop Project Site Visitation Post-Test

D. Protective Clothing and Equipment	Student will be able to explain the purpose of protective clothing and will describe the proper use of such equipment. Student will also learn to store and keep the safety attires in good and safe conditions.	Handouts Lecture and Demonstration Catalogs Safety Clothing Chart Post-Test
E. Protective Guards	Student will explain the purpose of all safety guards and their importance to the safety and well being of each worker. Student will sign a pledge to the teacher not to remove guards while using any portable and stationary equipment.	Handouts Individual Equipment Safety Pledge Card Demonstration Post-Test
F. Roof Brackets	Student will discuss the importance of using roof brackets to safely install roofing materials. Student will be able to distinguish between safe and unsafe roofing work.	Handouts Lecture and Demonstration Site Visitation Assignments Construct Model Roof Brackets Post-Test
G. Material Handling	Student will be able to safely handle hazardous and flammable materials. Student will understand the unsafe practices of the past and will learn to do the job safely.	OSHA Hazardous Chart Nomenclature Chart Demonstration Post-Test
H. Safe Lifting	Student will practice lifting heavy objects safely with the use and support of their legs. Student will recognize that the "Macho" image years are long gone and they should take care of themselves.	Guest Speaker Lifting Demostration Reading on Ergonomics Body Chart Post-Test

I. First Aid	Student will be able to identify symptoms of an ill or injured person and will be able to provide immediate help while outside help is being sought. Student will learn to be calm and be on top of a situation at all times.	First Aid Chart Demonstration by Nurses Safety Procedures Class Practice Emergency Channels on CB's and Telephones Post-Test
J. Color Code	Student will be able to identify the different types of safety color codes and what each color signifies. Student will also be able to explain what each color conveys on a job site.	OSHA Safety Color Codes Site Visitation Lecture Post-Test
K. Fire Safety	Student will be able to identify and distinguish the various types of fires and will be able to select the appropriate extinguishers for the fires.	Handouts on Fire Codes Shop Escape Route Guest Speaker from Truk Police and Fire Department Post-Test
L. Hand Tools and Power Equipment Safety	Student will practice using all hand tools and power equipment properly and safely.	Refer to Units on both Hand Tools and Power Equipments.
M. Safety Pledge	Student will discuss the purpose of the safety pledge and will sign one to signify that they are willing to abide by the safety rules at all times.	Safety Pledge Nomenclature Chart
N. Safety Tests	Student will memorize and "must" pass all safety test before they are permitted to use or operate any tools and equipment.	Tools and Equipments Safety Test.

UNIT II: Mathematics for Carpenters.

Major Objective: After completing this unit the students will be able to understand and be able to perform practical mathematics problems for carpenters. Student will take this unit as a refresher course for higher grades level or as an introductory course for a carpentry program.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	After completing this unit the student will be able to perform the following mathematics functions:	
A. Linear Measure	Student will apply the principles of linear measure to the field of carpentry.	Mathematics for Carpenters pp. 80 - 86 Classwork and Assignments Post-Test
B. Square Measure	Student will apply the principles of square measure to the field of carpentry.	Mathematics for Carpenters pp. 87 - 91 Classwork and Assignments Post-Test
C. Board Measure	Student will be estimate board measurements as required by the field of carpentry.	Mathematics for Carpenters pp. 113 - 116 Classwork and Assignments Post-Test
D. Volume Measurement-Cubes and Rectangular Solids	Student will apply the principles of cubic measure to the field of carpentry.	Mathematics for Carpenters pp. 108 - 112 Classwork and Assignments Post-Test
E. Weight Measure	Student will employ the principles of weight measure to the field of carpentry.	Mathematics for Carpenters pp. 120 - 124 Classwork and Assignments Post-Test

F. Ratio and Proportion	Student will relate the principles of ratio and proportion to the field of carpentry with particular emphasis framing and conrete mixes.	Mathematics for Carpenters pp. 125 - 132 Classwork and Assignments Post-Test
G. Powers and Roots	Student will employ the principles of powers or exponents to the field of carpentry.	Mathematics for Carpenters pp. 133 - 135 Classwork and Assignments Post-Test
H. The Framing Square	Student will understand all the different tables on the four sides of the framing square.	Mathematics for Carpenters pp. 97 - 100 Classwork and Assignments Post-Test
I. Surface Measurements: Triangles	Student will calculate a surface area of a triangular figure as applied in the field of carpentry.	Mathematics for Carpenters pp. 92 - 96 Classwork and Assignments Post-Test
J. Surface Measurement: Irregular Figures	Student will measure the surface of irregular figures found in the field of carpentry.	Mathematics for Carpenters pp. 101 - 104 Classwork and Assignments Post-Test
K. Surface Measurement: Circles	Student will measure a surface area of a circle as applied in the field of carpentry.	Mathematics for Carpenters pp. 105 - 107 Classwork and Assignments Post-Test
L. Volume Measurement: Cylinders	Student will assess the volume of cylinders as applied in the field of carpentry.	Mathematics for Carpenters pp. 117 - 119 Classwork and Assignments Post-Test

UNIT III: Plan Reading and Interpretation

Major Objective: After completing this unit the student will be able to read and interpret blueprints and other working drawings as required by carpentry trade. Student will be able to use and read architectural and engineering scales.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to read and interpret working drawings essential for carpentry work.	
A. Architectural Working Drawings	Student will be able to describe various architectural drawings and will be able to locate and identify scaled parts of the building as they appear in the working drawing.	Feirer and Hutchings pp. 38 - 39 Various Drawings Classwork and Assignments Post-Test
1. Structural Members	Student will be able to identify structural members of a building and will read them correctly in the working drawings, namely: a. Footings b. Vertical Members c. Columns d. Piers (CMU, Wood and Concrete) e. Studs and Posts	Feirer and Hutchings p. 38 Various Drawings Reading Assignments Classwork Post-Test
2. Horizontal Members	Student will be able to recognize horizontal members of a building and will locate them correctly on the working drawings, namely: a. Joists	Feirer and Hutchings pp. 38 - 39 Various Drawings Classwork and Assignments Drawing Assignments Post-Test

	1. Floor 2. Ceiling b. Beams 1. Top Plate 2. Sole Plate c. Girders d. Lintels	
3. Roof Members	Student will be able to identify roof members of a building and will locate them on the roof plan of a working drawings, namely: a. Common Rafters b. Hip and Valley Rafters c. Hip, Valley and Cripple Jack Rafters d. Purlins and Nailers e. Trusses	Feirer and Hutchings p. 39 Various Drawings Classwork and Assignments Sketching Assignments Post-Test
4. Flooring	Student will be able to describe flooring materials required for a building and will locate and name them correctly as they appear in the working drawings.	Feirer and Hutchings p. 39 Various Drawings Classwork and Assignments Post-Test
5. Sheathing, Siding and Roofing	Student will be able to recognize materials required for sheathing, siding and roofing and will identify them correctly as they appear on the working drawings.	Feirer and Hutchings p. 39 Various Drawings Classwork and Assignments Post-Test
6. Utilities	Student will distinguish all utility symbols and will identify them correctly as they appear in working drawings.	Feirer and Hutchings p. 39 Various Drawings Classwork and Assignments Post-Test

7. Finishing and and Painting	Student will be able to read and interpret the finishing and painting schedules.	Feirer and Hutchings p. 39 Classwork and Assignments Post-Test
B. Principles of Construction Drawing	Student will describe and explain the principles of construction and/or working drawings.	Feirer and Hutchings pp. 39 - 61
1. Plans	Student will explain the different plans required in a complete set of working drawings. Student will distinguish the following drawings and will read them correctly. a. Site Plan b. Foundation Plan c. Floor Plan d. Roof Plan e. Basement Plan (if applicable)	Feirer and Hutchnigs pp. 39 - 43 & 52 - 53,56 Various Building Plans Classwork and Assignments Drawing Assignments Post-Test
2. Elevations	Student will will able to describe the purpose of elevation drawings and will read the following: a. Front Elevation b. Left Side Elevation c. Right Side Elevation d. Rear Elevation	Feirer and Hutchings pp. 44 -45 & 56 - 57 Various Elevations Drawings Drawing Assignments Classwork and Assignments Post-Test
3. Framing Plans	Student will identify and discuss various framing plans and will read and interpret them correctly. a. Floor Framing Plan b. Wall Framing Plan c. Roof Framing Plan	Feirer and Hutchings pp. 46 - 47 Various Framing Plans Sketching Assignments Classwork and Assignments Post-Test

4. Sectional Views	Student will identify sectional views and will read and interpret them correctly. a. Typical Sections b. Specific Sections	Feirer and Hutchings pp. 48 - 48 Various Sectional Views of Different Buildings Drawing assignments Classwork and Assignments Post-Test
5. Detail Drawings	Student will be able to decribe detail drawings and will explain them correctly. Student will also recall the relationship between sectional views and details.	Feirer and Hutchings pp. 54 - 55 Various Detailed Drawings Classwork and Assignments Post-Test
6. Dimensioning Working Drawings	Student will demonstrate the purpose and function of dimensioning working drawings.	Feirer and Hutchings p. 58 Various Drawings Classwork and Assignments Post-Test
7. Notes and Specifications	Student will interpret the purpose of various notes and specifications in the working drawing. Student will also be able to demonstrate the relationship between the notes and specifications.	Feirer and Hutchings pp. 58 - 59 Various Drawings Truk State Building Code Classwork and Assignments Post-Test
8. Bill of Materials	Student will be able to prepare a bill of materials based on the working drawings. Student will practice filling out State of Truk bill of materials form.	Feirer and Hutchings pp. 58 - 61 Various Bill of Materials Class Project Post-Test

UNIT IV: Building Materials and Hardware (Review)

Major Objective: After completing this unit the student will be able to distinguish the various building materials used in the field of carpentry. They will be able to identify all materials available to the carpenters in the State of Truk and Federated States of Micronesia in general.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	After completing this unit the student will be able to identify the various types, styles and sizes of building materials available in their home state, Truk.	
A. Wood - Its Nature and Properties	Student will distinguish the various types and properties of wood. Special emphasis will be placed on the study of local wood. The following characteristics of wood will be learned: a. Parts of a Tree (English and Local Names) b. Specific Gravity c. Cell Structure (Local vs Import) d. Growth Rings e. Softwoods and Hardwoods f. Cutting Methods (Sawmill and Chainsaw) g. Shrinkage of Lumber h. Lumber Defects	Cabinetmaking and Millwork John L. Feirer, Author (1982) pp. 66 - 80 Reading Assignments Science Lectures Visit to Local Lumberyard Class Project Making a Nomenclature Chart of Local Trees used in Building Residential Structures Post-Test Tension and Compression Test Testing Equipment are Available. Post-Test
B. Kinds of Wood	Student will list and record the various types of wood being imported to Truk from the United States	Cabinetmaking and Millwork pp. 80 - 100 Visit to Lumberyard

	and the Phillipines. Student will identify the local wood which can substitute for the imported woods from other parts of the world.	Import - Export Statistics Guest Lecturer from the Local Community. Individual Projects Relating to the types of wood. Post-Test
C. Fine Furniture Wood	Student will be able to distinguish the various types of wood which are considered the best in making furnitures. Emphasis will be placed on local wood which can replace the imports.	Cabinetmaking and Millwork pp. 101 - 116 Visit to Lumberyard Visitation to Small Industry Special Project Working Drawings Containing Furniture Specifications. Post-Test
D. Sizes of Boards and Lumber	Student will be able to determine the size of dimensioned boards and lumber by sight. Student will know the difference between nominal and actual size.	Lecture and Handouts Visit to Lumberyard Reading Materials Post-Test
E. Plywood	Student will learn the history of plywood and will be able to apply plywood in various type of carpentry jobs.	Cabinetmaking and Millwork pp. 116 - 128 Reading Assignments Post-Test
1. Advantages of Plywood	Student will be able to list the advantages of plywood as a building material.	Cabinetmaking and Millwork p. 117 Post-Test
2. Kinds of Plywood Construction	Student will be able to describe two different types of plywood namely: a. Veneer-Core b. Lumber-Core	Cabinetmaking and Millwork pp. 118 - 119 Reading Assignments Site Visitation Post-Test

3. Manufacture of Plywood	Student will be able review the the different steps of plywood production starting from the tree harvest to the finished product.	Cabinetmaking and Millwork pp. 120 - 123 Reading Assignments Post-Test A Film Showing the Manucfacture of Plywood if such a Film is Available.
4. Hardwood Plywood Grading	Student will describe the different types of plywood grading and will be able to distinguish the grades based on the following: a. Grades as Shown b. Types of Bonding c. Dimensions d. Thickness e. Molded Plywood f. Appearance of Hardwood Veneers	Cabinetmaking and Millwork pp. 123 - 125 Reading Assignments Nomenclature Chart of Various Types of Plywood. Site Visitation Post-Test
5. Working with Plywood	Student will recall and list the different ways of using plywood. Namely the following: a. Storage b. Cutting c. Selecting Plywood for a Job d. Planing Edges e. Treating Edges f. Using Nails and Screws g. Drilling and Boring h. Selecting Corner Joints i. Protecting the Face Veneer j. Sanding k. Gluing l. Removing Nails	Cabinetmaking and Millwork pp. 127 - 129 Various Shop Projects to be assigned by the Instructor Working Drawings School Shop Magazine Post-Test

F. Hardboard and Particle Board	Student will be able to describe how particle and hardboard are made and the different methods of using them for carpentry projects.	Cabinetmaking and Millwork pp. 129 - 131 Various Shop Projects Post-Test
G. Millwork and Molding	Student will explain various types of millwork and molding using imports as well as locally produced materials.	Cabinetmaking and Millwork pp. 139 - 147 Shop Projects Various Magazines Post-Test
H. Fasteners and Fastening Tools	Student will be able to use various fastening materials and devices to bond different objects and parts together.	Cabinetmaking and Millwork pp. 147 - 162 Shop Exercises Post-Test
1. Nails and Nailing Tools	Student will be able to describe different types of nails and the various applications.	Cabinetmaking and Millwork pp. 148 - 150 Shop Exercises Nomenclature Chart Post-Test
2. Screws	Student will know the names and sizes of various types of screws as well as the different jobs requiring screws. Student will be able to use each tool required for the installation of screws.	Cabinetmaking and Millwork pp. 151 - 158 Shop Exercises Nomenclature Chart Post-Test
3. Hollow-Wall Fastening Device	Student will list and identify the name, the proper and safe uses of devices needed to fasten objects, and the hardware to hollow-walled structure.	Cabinetmaking and Millwork pp. 158 - 160 Shop Exercises Nomenclature Chart Post-Test

4. Masonry Fasteners	Student will identify the various masonry fasteners and will be able to use each fastener properly and safely.	Cabinetmaking and Millwork pp. 160 - 161 Shop Exercises Post-Test
5. Miter-Joint Fasteners	Student will name the various miter-joint fasteners and will be able to use each fastener properly and safely.	Cabinetmaking and Millwork pp. 161 - 162 Shop Exercises Post-Test
I. Hardware	Student will illustrate how to use the cabinetmaking and millwork hardware and will be able to install each.	Cabinetmaking and Millwork pp. 162 - 166 Shop Exercises Nomenclature Chart Handouts Post-Test
J. Glass and Mirrors	Student will name and describe all materials made out of glass and will be able to use them safely in a carpentry job.	Cabinetmaking and Millwork pp. 166 - 172 Shop Exercises Demonstration Post-Test
K. Lumbers	Student will recall how to properly order lumber by both lineal feet and board-feet. (Also refer to the math section on board-feet)	Cabinetmaking and Millwork pp. 174 - 185 Visit to Lumberyard Shop Project Post-Test

CONSTRUCTION CARPENTRY

11TH GRADE

A. COURSE TITLE: CARPENTRY III

B. COURSE DESCRIPTION

This is a one year course that will enable the student to learn about building layout and framing as part of a construction carpentry program. The course covers building layout and framing. The layout portion of this course covers site selection, erection of batter boards, establishing corners, leveling a building (both manually and with specific equipments), setting forms and backfilling. The framing portion of this course covers framing from foundation to the beam and top plate.

Practical applications include the use of hand tools, test and surveying equipment, direction of heavy equipment (for backfilling and excavation), framing square and leveling hose.

C. GOAL

The goals of this course are to introduce the student to the world of construction carpentry and the various opportunities of a career in the area of building layout and framing. It is also to develop skills, knowledge and attitudes that will enhance the student's ability to cope in the highly technological society which they live in today. Furthermore, this course will help train enough young men and women to fill the gap in the booming building industry in the State of Truk and the whole of Federated States of Micronesia.

D. COURSE OBJECTIVES

1. Appraise opportunities of a trade in the area of building layout and framing and its requirements for gainful entry-level employment.

2. Demonstrate habits which are genuinely needed and are conducive to learning.

3. Master the use of various leveling and surveying instruments especially transit, builder's level, line level and water leveling hose.

4. Explain the use and functions of all tables stamped on all four sides of a framing square.

5. Explain the traditional taboos involving building in the State of Truk and compare them to other states and nations in the Pacific.

6. Demonstrate the skills by constructing a small scaled building without the help of the instructor.

7. Visit various sites in the State of Truk and make a recommendations to the landowners as to how they should locate a building on their property and why.

8. Gain part-time jobs in the construction industry.

E. CURRICULUM OUTLINE

Unit I: Building Layout

A. Laying Out from Reference Line
B. Laying Out with Transit and/or Builder's Level

1. Instruments
2. Reference Points
3. Setting up a Level
4. Establishing Points on a Line
5. Laying Out a Right Angle
6. Staking Out the Building
7. Laying Out a Simple Rectangle
8. Laying Out an Irregularly Shaped Building
9. Batter Boards
10. Grade Line
11. Establishing Elevations
12. Measuring Difference in Elevations

C. Height of Foundation Walls
D. Excavation
E. Leveling Manually

1. Spirit Level
2. Water Hose
3. Line Level
4. Sighting

F. Squaring Manually

1. Framing Square
2. Combination Square
3. 3-4-5 Method

Unit II: Framing

A. Methods of Framing
B. Floor Framing

1. Post
2. Girders
3. Wood-Sill Construction
4. Floor Joist and Platform Construction

5. Floor Openings
6. Bridging
7. Estimating Floor Framing Materials
8. Local Materials

C. Wall Framing

1. Laying Out Wall Locations
2. Sole Plate
3. Wall Openings
4. Top Plate
5. Studs (Regular, Cripple and Trimmer)
6. Headers
7. Bracing
8. Straightening Walls
9. Partitions
10. Special Framing
11. Estimating

D. Wall Sheathing and Covering

1. Flat Tin
2. Corrugated Tin
3. Plywood
4. Board
5. Estimating

E. Ceiling Framing

1. Ceiling Joist
2. Estimating

UNIT I: Building Layout

Major Objective: After completing this unit the student will be able to choose a site and locate a building according to plans on the site. This unit is the cornerstone of carpentry and building construction and therefore student "must" master this unit before proceeding to the next unit.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to lay out a house on a building site without the assistance of the instructor.	
A. Laying Out from a Reference Line.	Student will demonstrate how to lay a house using reference points stated in the working drawing.	Carpentry and Building Construction. John L. Feirer and Gilbert Hutchings (Authors). pp. 203 - 204 Blueprints Post-Test
B. Laying Out with a Transit and/or Builders Level.	Student will illustrate laying out a building with the aid of Transit and/or Builders Level.	Feirer and Hutchings pp. 204 - 210 Field Project Post-Test
1. Instruments	Student will distinguish the two types of instruments and will operate them properly.	Feirer and Hutchings pp. 204 - 205 Field Practice Post-Test
2. Reference Points	Students will establish reference points using a Transit and/or Builders Level.	Feirer and Hutchings pp. 204 - 205 Field Practice Post-Test

3. Setting up a Level	Student will illustrate the proper and safe set-up of a Transit and/or Builders Level.	Feirer and Hutchings pp. 205 - 206 Field Practice Post-Test
4. Establishing Points on a Line	Student will explain how to establish points on a line using the Transit and/or Builders Level.	Feirer and Hutchings p. 206 Field Practice Post-Test
5. Laying Out a Right Angle	Student will discuss how to lay out right angle using the Transit and/or Builders Level.	Feirer and Hutchings p. 207 Field Practice Post-Test
6. Staking out the Building	Student will stake out a building using the Transit and/or Builders Level.	Feirer and Hutchings p. 207 Field Practice Post-Test
7. Laying Out a Simple Rectangle	Student will describe how to lay out a simple rectangle to simulate a rectangular house.	Feirer and Hutchings p. 207 Field Practice Post-Test
8. Laying Out an Irregularly Shaped Building	Student will demonstrate how to lay out an irregularly shaped building on a building site.	Feirer and Hutchings pp. 207 - 208 Field Practice Post-Test
9. Batter Boards	Student will establish and construct batter boards according to plans depicted on the working drawing.	Feirer and Hutchings pp. 208 - 209 Field Practice Post-Test

10. Grade Line	Student will describe how to lay out the correct grade line according to a plan.	Feirer and Hutchings p. 209 Blueprints Field Practice Post-Test
11. Establishing Elevations	Student will explain how to establish elevations based on the blueprints.	Feirer and Hutchings pp. 209 - 210 Blueprints Field Practice Post-Test
12. Measuring Difference in Elevations	Student will discuss how to use Transit and/or Builders Level to level and measure the difference in building elevations.	Feirer and Hutchings p. 210 Field Practice Post-Test
C. Height of Foundation Walls	Student will read and determine the height of piers and foundation walls according to blueprints.	Feirer and Hutchings pp. 210 - 212 Field Practice Post-Test
D. Excavation	Student will describe the process of safe excavation using heavy equipments and will be able to excavate using picks and shovels.	Feirer and Hutchings pp. 212 - 216 Field Practice Site Visitation Post-Test
E. Leveling Manually	Student will describe how to level a building and establishing elevations using the following tools and devices: a. Spirit Level b. Water Hose c. Line Level d. Sighting	Lecture and Demonstration by the Instructor Field Practice Site Visitation Demonstration Individual Projects Post-Test

F. Squaring Manually	Student will explain how to square a building manually using the following tools and methods: a. Framing Square b. Combination Square c. 3-4-5 Method	Lecture and Demonstration by the Instructor Field Practice Demonstration Site Visitation Individual Projects Post-Test

UNIT II: Framing

Major Objective: After completing this framing unit the student should be able to frame a house from the floor up to the roof. This will also enable the student to find a job as a carpenter's helper in the field of construction in the state of Truk. This unit is complicated; therefore the student enrolling in this unit "MUST" have completed all the basic carpentry units. Individual projects to test skills before moving on is very important.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to perform each tasks at a job entry-level.	
A. Methods of Framing	Student will identify all the different types of framing in the field of carpentry.	Feirer and Hutchings pp. 291 - 298 Post Test
B. Floor Framing	Student will identify all parts of a building and their functions.	ID Exercise Post-Test
1. Post	Student will understand the purpose of a post and how it is installed and used in the building	Feirer and Hutchings pp. 299 Practical Project Post-Test
2. Girders	Student will understand the purpose of the girder and how it is installed. (Both wood and metal girders)	Feirer and Hutchings pp. 301 - 302 Practical Project Post-Test
3. Wood-Sill Construction	Student will describe the purpose of wood-sill construction and how it is installed in the building.	Feirer and Hutchings pp. 302 - 306 Practical Project Post-Test

4. Floor Joists and Platform Construction	Student will decsribe the purpose of floor joists and how it they are framed on a platform constructed building.	Feirer and Hutchings pp. 307 - 308 Practical Projects Post-Test
5. Floor Openings	Student will identify the purpose of floor openings and how to they are framed.	Feirer and Hutchings pp. 309 - 310 Site Visitation Post-Test
6. Bridging	Student will explain the purpose of bridging and how to install it. Student will be able to cut correct bridging length using the framing square.	Feirer and Hutchings pp. 311 - 318 Practical Project Framing Square Post-Test
7. Estimating Floor Framing Materials	Student will estimate the right the amount of materials required for a given project. (Quantity and Cost)	Feirer and Hutchings pp. 318 - 334 Math for Carpenters Post-Test
8. Local Materials	Student will identify and use local materials (e.g. Mangrove wood) to frame the floor of a house.	Local Carpenters who are expert in the use of local materials.
C. Wall Framing	Student will list and distinguish all parts of wall framing.	Parts of a Wall Sketching Post-Test
1. Laying Out Wall Locations	Student will lay out wall locations using a tape-ruler and a combination square.	Feirer and Hutchings pp. 335 - 337 Practical Project Post-Test

2. Sole Plate	Student will identify the purpose of the sole plate and be able to cut it to the appropriate length.	Feirer and Hutchings pp. 337 - 339 Practical Project Post-Test
3. Wall Openings	Student will recognize and locate openings for doors and windows as identified in the working drawing.	Feirer and Hutchings pp. 340 - 342 Working Drawing Post-Test
4. Top Plate	Student will recognize the purpose of top plates and will be able to lay out the parts.	Feirer and Hutchings p. 342 Working Drawings Shop Project
5. Studs (Regular, Cripple and Trimmer)	Student will list the purpose of each stud and will be able to cut each accordingly for a given job or for a shop project.	Feirer and Hutchings pp. 343 - 354 Practical Project Working Drawing
6. Headers	Student will know the purpose of the header and will be able to construct headers for given projects based on the working drawing.	Feirer and Hutchings pp. 354 - 356 Working Drawing Practical Project Post-Test
7. Bracing	Student will distinguish between temporary and permanent bracing and will be able to brace walls when lifted into place.	Feirer and Hutchings pp. 358 - 360 Demonstration by the Instructor Post-Test
8. Straightening Walls	Student will straighten a wall using both the plumb bob and a level.	Feirer and Hutchings pp. 360 - 368 Demostration by the Instructor Post-Test

9. Partitions	Student will be able to frame partitions according to plans for a given project. Different means of connecting the walls will be demonstrated by the student.	Feirer and Hutchings pp. 368 - 374 Shop Project Practical Project Post-Test
10. Special Framing	Student will relate to special framing that allows for installments of various furniture and hardware.	Feirer and Hutchings pp. 371 - 382 Working Drawings Post-Test
11. Estimating	Student will estimate the amount of materials needed to complete a small single-unit wood frame house.	Feirer and Hutchings pp. 383 - 390 Working Drawing Math for Carpenters Post-Test
D. Wall Sheathing and Covering	Student will know the purpose of wall covering and materials available in the State of Truk for this purpose.	Visit to Construction Site and also to Hardware Stores which sells such Materials Feirer and Hutchings pp. 661 - 702 Post-Test
1. Flat Tin	Student will use flat tin to construct a wall.	Demonstration Practical Project
2. Corrugated Tin	Student will construct an exterior wall using this very commonly used material.	Demonstration Practical Project Site Visitation
3. Plywood	Student will install exterior wall using plywood. They will also be able to select the type and grade of plywood that will withstand the weather.	Feirer and Hutchings Demostration School Repair Practical Project

4. Board	Student will apply the exterior wall using boards, both imported and locally produced.	Demonstration Site Visitation Practical Project
5. Estimating	Student will learn to estimate amount of materials required to completet a given project. Student will estimate amount of required material for a small single unit house.	Feirer and Hutchings pp. 703 - 707 Math for Carpenters Blueprints Post-Test
E. Ceiling Framing	Student will identify the purpose of the ceiling and how to install the parts.	Feirer and Hutchings pp. 402 - 406 Practical Project Post-Test
1. Ceiling Joist	Student will calculate the correct size and amount of ceiling joists and will be able to lay out the joists.	Feirer and Hutchings pp. 403- 404 Practical Project Post-Test
2. Estimating	Student will estimate the correct amount of materials required to frame a house according to plans.	Feirer and Hutchings pp. 406 - 410 Blueprints Post-Test

CONSTRUCTION CARPENTRY

12TH GRADE

A. COURSE TITLE: CARPENTRY IV

B. COURSE DESCRIPTION

This is a one year course designed for the 12th grade (Senior) level. It is a study of the advanced concepts of masonry and woodwork and how they relate to humankind and the field of construction carpentry. Utilizing various methods such as shop work and demonstrations, field trips and resource speakers, class lectures and demonstrations, including testing and evaluation, the students will explore topics such as: orientation to construction and carpentry, power tools and equipment, cement and concrete, advanced framing, finish carpentry and estimating. This course will enable the students to acquire jobs at the apprentice level in the building industry in the State of Truk and the whole of the Federated States of Micronesia.

C. GOAL

The goals of this course are to introduce the student to the world of advanced carpentry and the various opportunities of a career in this ever growing field. This is the final course for those students who choose to major in construction and therefore the course is also designed to teach independence and creative thinking. Individual projects will be supervised by the course instructor, however the design, estimating and the final product will be left to the student.

D. COURSE OBJECTIVES

1. Demonstrate knowledge of the capentry trade as part of the overall construction field.

2. Master the use of the framing square in relation to roof framing, stair framing and fabrication, octagon tables and board feet estimation.

3. Explain and discuss the various components of cement and concrete including specific knowledge in tilt-up construction, concrete hollow-block construction and cast-in-place construction.

4. Estimate the quantity of materials required to complete various jobs as called for in the working drawing.

5. Understand the history, purpose and role of trade unions in the building industry.

6. Draw, plan and interpret working drawings and blueprints.

7. Familiarity with the various requirements for building in Micronesia with special emphasis on the Federated States of Micronesia.

8. Develop habits and attitudes conducive to learning and holding on to a job.

9. Explain all safety considerations relating to the building industry and to shop work.

10. Understand the provisions of the Compact of Free Association which relates to immigration status.

11. Explain the various aspects of skills training and personnel development programs open to FSM citizens.

E. CURRICULUM OUTLINE

Unit I: Orientation to Construction and Carpentry

A. History of Carpentry and the Construction Industry
B. Career Opportunities

1. Job Opportunities
2. Job Requirements
3. Training
4. Regional Training
5. Civic Action Team (CAT)

C. Trade Unions
D. Job Applications
E. Resume
F. Job Interview
G. Compact of Free Association (COFA)

Unit II: Power Tools and Equipment

A. Power Saws
B. Power Planes
C. Powered Carving Tools
D. Power Drills
E. Power Sanders

Unit III: Cement and Concrete

A. Concrete and Footings

1. Concrete Ingredients
2. Proportions
3. Pouring Concrete
4. Footing
5. Estimating

B. Poured Concrete Foundation Walls

1. Crawl Space
2. Sill Plate Anchors
3. Reinforcing Poured Walls
4. Estimating

C. Concrete Masonry Unit (CMU)

1. Mortar
2. Laying the First Block
3. Special Blocks
4. Tooling
5. Finishing Foundation Walls
6. Installing Anchor Bolts and Iron
7. Control Joints
8. Lintels
9. Related Operations
10. Estimating
11. Surface Bonding of CMU

D. Concrete Flatwork
E. Concrete Forms
F. Steel Reinforcements

Unit IV: Framing

A. Roof Framing

1. Roof Styles
2. Roof Framing Terminology
3. Laying Out Roof Plan

B. Framing With Common Rafters

1. Pythagorean Method
2. Unit Length Method
3. Step-Off Method
4. Cutting Common Rafters
5. Overhang
6. Cheek Cut or Births Mouth

C. Hip and Valley Rafters
D. Jack Rafters
E. Layout and Erection of Trusses
F. Roof Trusses
G. Roof Sheathing
H. Roof Covering
I. Roof Trim
J. Window Framing
K. Door and Door Framing
L. Stairs

Unit V: Finishing Carpentry

A. Sound Insulation
B. Interior and Ceiling Finish
C. Ceiling Tile and Suspended Ceilings
D. Finish Flooring
E. Stairs
F. Cabinets and Built-Ins
G. Interior Trim
H. Interior Painting and Finishing
I. Exterior Painting

Unit VI: Estimating

A. Girders
B. Sills
C. Floor Joists
D. Bridging
E. Rough Flooring
F. Studs and Fire Stops
G. Wall Plates (Sole & Top)
H. Rafters
I. Ridgeboard
j. Sheathing
K. Siding (Board, Plywood and Tin)
L. Trim
M. Purlins
N. Roofing Materials
O. Ridge Caps
P. Door and Window Materials
Q. Stairs and Door Jambs
R. Finish Flooring
S. Hardware and Supplies
T. Concrete
U. Paint

UNIT I: Orientation to Construction and Carpentry

Major Objective: After completing this unit the student will be able to understand all the forces that shape the whole construction industry in the State of Truk, the Federated States of Micronesia and the United States of America. Student will also learn the necessary skills and attitudes required if one is to succeed in the field of construction and carpentry.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completion of this unit the student will be able to know what it takes to be a part of this field.	
A. History of Carpentry and the Construction Industry	Student will memorize the history of carpentry as a trade and as a profession. History of the establishments of carpentry programs in Truk will also be covered.	Lecture by the Instructor Reading Assignments Guest Speakers Post-Test
B. Career Opportunities	Student will identify the various options open to them once they have succesfully completed the whole prescribed carpentry program.	FSM Employment Data Current and Future Manpower Needs for the State of Truk and FSM Guest Speakers
1. Job Opportunities	Student will prepare an inventory of various job opportunities available to carpentry program completers.	Manpower Needs Skills Sheets Guest Speakers Post-Test
2. Job Requirements	Student will recall the traits that make a person a good carpenter. Student will also learn the importance of mathematics and English as requirements for good jobs.	Guest Speaker List of Traits Discussion

3. Training	Student will understand the various avenues in which they can further their training to enhance their skills.	Session with Counselors College Catalogs Various Brochures
4. Regional Training	Student will review the role of the following training schools and programs: a. Micronesian Occupational College (MOC) b. Trades, Testing and Training Program (T3) c. Community College of Micronesia (CCM) d. College of Micronesia Extension Centers e. Micronesian Trades and Apprenticeship Program (MTAP)	Session with Counselors Alumni Speakers Recruiters Catalogs and Brochures Guest Speakers from Extension Centers Field Trips Discussion
5. Civic Action Teams (CAT)	Student will interpret the role of the Civic Action Team in the State of Truk and also the Federated States of Micronesia.	Civic Action Team Members Compact of Free Association Document Truk State Training Officer
C. Trade Unions	Student will recall the history of the trade union and how they can help the individual tradesperson.	Lecture and Discussion Guest Speakers Post-Test
1. Advantages and Disadvantages of Trade Unions	Student will contrast the advantages and disadvantages of having trade unions. Student will also understand the barriers and problems relating to the local culture.	Lecture and Discussion Class Debate Writing Assignments Guest Speakers

D. Job Applications	Student will fill out various job applications. Student will create their own files for future use.	Session with Counselors FSM and Truk State Employment Application Forms Private Employment Application Forms.
E. Resume	Student will learn to write their own resume which will be kept in their personal file.	Sample Resume Resume Writing Exercise
F. Job Interview	Student will recall the do's and don'ts in the interviews. They will review the differences that might occur as a result of cross-cultural differences.	Session with Counselors Mock Interview Class Practice
G. Compact of Free Association (COFA)	Student will locate the provision of the COFA which provide them the opportunity to enter the United States and its possessions or to stay or seek employment.	Goverment Speaker Compact Document Reading Assignments
1. Problems	Student will express and list problems that might occur in Guam, Hawaii and the United States Mainland as they venture to seek greater opportunities.	Micronesian Seminar Speaker (Fran Hezel) News Clippings

UNIT II: Power Tools and Equipment

Major Objective: After completing this unit the student will be able to understand the "safe" use of all commercially available power tools and equipment. Emphasis will be on safety, maintenance and safekeeping of the power tools and equipment. Each student must pass a safety test with 100% accuracy and will only operate the power tools and equipment with the permission of the instructor or the job supervisor.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to pass the safety test for each power tool and equipment with 100% accuracy.	
A. Power Saws	Safe use, care and maintenance	Cabinetmaking and Millwork John L. Feirer, 2nd Edition
1. Circular Saw (Stationary)	Student will explain and do the following tasks using a stationary circular saw: a. Pass safety test b. Know all parts c. Do adjustments d. Sharpen the blades e. Select various blades f. Replace blades g. Crosscut and Ripping h. Develop and use various jigs	Cabinetmaking and Millwork pp. 267 - 305 Nomenclature Chart Shop Practice Demonstration Ordering of Parts Shop Project Safety Test
2. Circular Saw (Portable)	Student will explain and do the following tasks using a portable circular saw (also known as skill saw):	Cabinetmaking and Millwork pp. 360 - 362 Nomenclature Chart Demonstration

	a. Pass Safety Test b. Cross-cutting and Ripping c. Do pocket cuts d. Sharpen blades e. Choose correct blades	Shop Project Safety Test
3. Bayonet or Jig Saw	Student will explain and do the following tasks using a bayonet/jig saw: a. Pass safety test b. Select blades for various jobs c. Cut and Rip wood, plastic and sheet metal	Cabinetmaking and Millwork pp. 363 - 366 Nomenclature Chart Shop Project Demonstration Shop Project Safety Test
4. Reciprocating (Sabre) Saw	Student will explain and do the following tasks using a reciprocating saw: a. Pass Safety Test b. Select blades for various jobs c. Cut metal, wood and plastics	Cabinetmaking and Millwork pp. 167 -168 Nomenclature Chart Shop Practice Demostration Shop Project Safety Test
5. Radial Arm Saw	Student will explain and do the following tasks using a radial arm saw: a. Pass Safety Test b. Select correct blades for a job c. Make adjustments d. Crosscutting operations e. Ripping operations f. Bevel cutting and mitering g. Using assorted blades	Cabinetmaking and Millwork pp. 306 - 336 Nomenclature Chart Build Safety Jigs Demonstration Shop Project Safety Test

6. Band Saw	Student will explain and do the following tasks using a band saw: a. Pass Safety Test b. Know the size and parts c. Replace the blades d. Fold the blades e. Straight cutting f. Freehand cutting g. Cutting using a fence h. Cutting with miter gauge i. Freehand ripping j. Cut sharp and shallow curbs	Cabinetmaking and Millwork pp. 337 - 351 Build Safety Guards Nomenclature Chart Demonstration Shop Project Safety Test
7. Scroll Saw	Student will explain and do the following tasks using a scroll saw: a. Pass Safety Test b. Know all parts c. Select and install the right blades d. External curve cutting e. Internal curve cutting f. Straight cutting g. Bevel and angle sawing h. Cutting thin metal i. Filing	Cabinetmaking and Millwork pp. 351 - 359 Shop Practice Nomenclature Chart Demonstration Shop Project Safety Test
8. Powered Miter Saw	Student will explain and do the following tasks using a powered miter saw: a. Pass Safety Test b. Know all parts c. Crosscutting d. Angle cutting	Manufacturer's Uses Manual Nomenclature Chart Demonstration Build Safety Bench Shop Project Safety Test

B. Power Planes	Safe Use, Care and Maintenance	Cabinetmaking and Millwork John L. Feirer, 2nd Edition
1. Thickness Planer or Surfacer	Student will explain and do the following tasks using a thickness planer or surfacer: a. Pass Safety Test b. Know parts and controls c. Squaring legs d. Planing thin stocks	Cabinetmaking and Millwork pp. 160 - 166 Nomenclature Chart Push Sticks Demonstration Shop Project Safety Test
2. Jointer	Student will explain and do the following tasks with a jointer: a. Pass Safety Test b. Know parts and sizes c. Adjusting the cutter head d. Adjusting depth of cut e. Adjusting fence f. Squaring-up stock g. Edge and end jointing h. Facing and surfacing i. Rabbeting and chamfering j. Short and long taper	Cabinetmaking and Millwork pp. 370 - 380 Push Sticks Nomenclature Chart Demonstration Shop project Safety Test
3. Portable Power Plane	Student will explain and do the following tasks with a portable power plane: a. Pass Safety Test b. Know parts and sizes c. Surfacing and chamfering d. Sharpening of blades e. Adjusting the blades	Cabinetmaking and Millwork pp. 363, 368 - 369 Nomenclature Chart Cord Safety Demonstration Shop Project Safety Test

C. Powered Carving Tools	Safe Use, Care and Maintenance	Cabinetmaking and Millwork John L. Feirer, 2nd Edition
1. Router	Student will describe and do the following tasks with a router: a. Pass Safety Test b. Choose right router bit c. Assembling and Adjustment d. Controlling cutting e. Cutting rabbet f. Cutting groove g. Cutting blind mortise h. Cutting for spline joint i. Cutting dovetail-dado joint j. Hinge butt routing	Cabinetmaking and Millwork pp. 394 - 408 Router Guides Demonstration Nomenclature Chart Shop Project Safety Test
2. Woodlathe	Student will explain and perform the following tasks with a woodlathe: a. Pass Safety Test b. Know parts and sizes c. Know all turning tools d. Turn wood cylinder e. Taper cuts f. Cutting coves g. Cutting V's h. Bead cuts i. Turning complicated designs	Cabinetmaking and Millwork pp. 461 - 486 Safety Devices Demonstration Nomenclatture Chart Shop Project Delta Tools Catalog Safety Test
3. Shaper	Student will explain and perform the following tasks with a shaper: a. Pass Safety Test b. Know all parts	Cabinetmaking and Millwork pp. 381 - 393 Safety Devices Demonstration Nomenclature Chart

	c. Choose the right cutter for a job d. Safely install cutters e. Safely adjust the shaper f. Shaping with fence g. Cutting with shaper collars h. Shaping with patterns	Shop Project Delta Tools Catalog Safety Test
D. Power Drills	Safe Use, Care and Manitenance	Cabinetmaking and Millwork John L. Feirer, 2nd Edition
1. Drill Press	Student will describe and perform the following tasks with a drill press: a. Pass Safety Test b. Know parts c. Replace bits d. Sharpen drill bits e. Choose correct size of bits	Cabinetmaking and Millwork pp. 412 - 432 Safety Devices Demonstration Nomenclature Chart Shop Project Drilling Practice Safety Test
2. Portable Power Drill	Student will describe and perform the following tasks with a portable power drill: a. Pass Safety Test b. Choose the right bits c. Sharpen drill bits d. Know all parts e. Use all types of bits	Cabinetmaking and Millwork pp. 415 - 418 Demonstration Safety Devices Nomenclature Chart Shop or Field Project Involving Drilling Makita Tools Catalog Craftsman Tools Catalog Safety Test
E. Power Sanders	Safe Use, Care and Maintenance	Cabinetmaking and Millwork John L. Feirer, 2nd Edition
1. Coated Abrasives	Student will identify the different types of abrasives, how they are made and type of jobs they are used for in carpentry.	Cabinetmaking and Millwork pp. 441 - 446

2. Floor-Type Belt Sander	Student will describe and perform the following tasks with a floor-type belt sander: a. Pass Safety Test b. Know parts and names c. Safe sanding methods	Cabinetmaking and Millwork pp. 447 - 448 Demonstration Safety Devices Nomenclature Chart Sanding Project Safety Test
3. Floor-Type Disc Sander	Student will explain and perform the following tasks with a floor-type disc sander: a. Pass Safety Test b. Know parts and names c. Select right abrasives d. Mount abrasives to disc	Cabinetmaking and Millwork pp. 449 - 451 Demonstration Safety Devices Nomenclature Chart Sanding Project Safety Test
4. Portable Belt Sander	Student will explain and perform the following tasks with a portable belt sander: a. Pass Safety Test b. Know parts and names c. Choose right abrasives d. Mount abrasives e. Use safely	Cabinetmaking and Millwork pp. 453 - 454 Demonstration Safety Devices Nomenclature Chart Sanding Project Safety Test
5. Portable Disc Sander	Student will describe and perform the following tasks with a portable disc sander: a. Pass Safety Test b. Know parts and names c. Choose right abrasives d. Mount the disc safely	Cabinetmaking and Millwork pp. 457 - 459 Demonstration Safety Devices Nomenclature Chart Sanding and Shop Project Safety Test

6. Portable Finishing Sander	Student will explain and perform the following tasks with a portable finishing sander: a. Pass Safety Test b. Know parts and names c. Choose correct abrassive d. Mount abrassive correctly	Cabinetmaking and Millwork pp. 455 - 456 Demonstration Safety Devices Nomenclature Chart Sanding and Shop Project Safety Test

UNIT III: Cement and Concrete

Major Objective: After completing this unit the students will have learned the phenomena surrounding the field of concrete technology and masonry. This unit is supplementary to the carpentry program as in many instances, house building and construction in the State of Truk uses a combination of both concrete materials as well as wood. Knowledge gained in this unit will enable a student to obtain a job as masonry helper.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHOD
	Upon completing this unit the student will be able to perform various cement and concrete tasks at the job-entry level.	
A. Concrete and Footings	Student will describe the function and purpose of concrete as a building material.	Feirer and Hutchings p. 225
1. Concrete Ingredients	Student will identify the following ingredients of concrete and be able to distinguish them by sight. a. Cement b. Aggregate (Sand and Gravel) c. Water	Feirer and Hutchings pp. 225 - 226 Concrete Chart Site Visitation Portland Cement Chart Post-Test
2. Proportions	Student will measure the required amount of material for each batch of concrete.	Feirer and Hutchings p. 227 Mixing Practice Post-Test
3. Pouring Concrete	Student will describe the safe steps to pouring concrete and will safely demonstrate this for a given project.	Feirer and Hutchings pp. 227 - 228 Construction Site Site Visitation Post-Test

4. Footing	Student will identify and explain the function and purpose of the following: a. Wall footings b. Footing Forms c. Pier, Post and Column footing d. Stepped footing e. Footing drains	Feirer and Hutchings pp. 229 - 234 Working Drawings Field Trip Demonstration Construction Site Site Visitation Post-Test
5. Estimating	Student will estimate the correct amount of concrete materials required for a given project.	Feirer and Hutchings pp. 235 - 237 Estimating Unit Post-Test
B. Poured Concrete Foundation Walls	Student will identify the purpose of poured concrete foundation walls and will be able to construct one.	Feirer and Hutchings pp. 238 - 240 Demonstration Field Practice Post Test
1. Crawl Space	Student will explain the purpose of a crawl space and will form one according to specification.	Feirer and Hutchings p. 241 Site Visitation Blueprints
2. Sill Plate Anchors	Student will mount sill and plate anchors and will be able to install them according to specifications.	Feirer and Hutchings pp. 241 - 242 Working Drawings
3. Reinforcing Poured Walls	Student will describe how to reinforce poured walls according to specifications.	Feirer and Hutchings pp. 242 - 244 Blueprints Post-Test

4. Estimating	Student will estimate amount of concrete materials as required for a given job.	Feirer and Hutchings pp. 245 - 246 Working Drawings Post-Test See Estimating Section
C. Concrete Masonry Unit	Student will explain the purpose of concrete blocks and will be able to construct a wall using this material.	Feirer and Hutchings pp. 247 - 248 Post-Test
1. Mortar	Student will discuss how to mix mortar and will demonstrate the technique according to the specifications	Feirer and Hutchings pp. 248 - 250 Practice Mixing Site Visitation Post-Test
2. Laying the First Block	Student will describe how to lay the first block according to specifications.	Feirer and Hutchings pp. 250 - 255 Site Visitation Demonstration Practical Project Post-Test
3. Special Blocks	Student will describe and perform the following blocklaying tasks: a. Between Corners b. Closure Block c. Intersecting Bearing Walls d. Intersecting Non-Bearing Walls	Feirer and Hutchings pp. 255 - 258 Block Schedule Demonstration Site Visitation Practical Project Post-Test
4. Tooling	Student will practice tooling CMU joints according to specifications.	Feirer and Hutchings pp. 258 - 259 Demonstration Practical Project Post-Test

5. Finishing Foundation Walls	Student will perform finishing touches on foundation walls according to specifications.	Feirer and Hutchings p. 259 Demonstration Post-Test
6. Installing Anchor Bolts	Student will identify the purpose of anchor bolts and will be able to install them according to specifications.	Feirer and Hutchings pp. 259 - 260 Demonstration Site Visitation Blueprints
7. Control Joints	Student will describe the function of control joints and will be able to set such joints according to specifications.	Feirer and Hutchings pp. 260 - 261 Demonstration Blueprints Post-Test
8. Lintels	Student will review the function of lintels and will be able to install lintel block according to the specifications.	Feirer and Hutchings pp. 261 - 262 Demonstration Blueprints Post-Test
9. Related Operations	Student will discuss and perform the following CMU functions: a. Cut Blocks b. Patching Blocks c. Cleaning Blocks d. Protecting Blocks	Feirer and Hutchings pp. 262 - 263 Demonstration Practical Project Site Visitation Lot of Practice
10. Estimating	Student will estimate amount of concrete materials required for a project. Specifically, student will be able to do the following estimating tasks:	Feirer and Hutchings pp. 263 - 264 Demonstration Blueprints Class work and assignments

	a. Number of Blocks b. Amount of Mortar c. Labour Costs	Post-Test
11. Surface Bonding of CMU	Student will discuss the latest concerning this new method of CMU bonding. Student will be able to perform the following: a. Layout b. Stack CMU c. Shim d. Anchor Intersecting Walls e. Control Joints f. Window and Door Placements g. Install the Top Course h. Finishing and Curing i. Backfilling and Repairs	Feirer and Hutchings pp. 266 - 273 Demonstration Practical Project Post-Test Note: If the Materials are not yet available in Truk, this unit may be skipped entirely.
D. Concrete Flatwork	Student will describe the essentials of concrete flatwork and will perform the related tasks according to the specifications.	Feirer and Hutchings pp. 274 - 289 Practical Project Post-Test
1. Concrete Floor Slabs on Ground	Student will explain the requirements for slabs on grade and will be able to perform the following: a. Combined Slab and Foundation b. Independent Concrete Slab and Foundation Walls	Feirer and Hutchings pp. 274 - 275 Blueprints Demonstration Site Preparation Post-Test
2. Concrete Floor Slab Requirements	Student will illustrate how to perform the following tasks:	Feirer and Hutchings pp. 275 - 276

	a. Finish Grade Above Ground b. Removing Top Soil c. Installing Pipes d. Compacting Gravel Base Coarse e. Installating the Vapor Barrier f. Reinforcing with WWF g. Compaction	Handouts Blueprints Demonstration Site Visitation Practical Project
3. Constructing a Concrete Floor Slab	Student will explain how to perform the following tasks: a. Prepare Subgrade b. Granular Fill c. Install Provisions for Mechanical Trades d. Damp-proofing e. Pouring Concrete f. Reinforcing the Concrete	Feirer and Hutchings pp. 276 - 280 Site Visitation Demonstration Blueprints Practical Project Post-Test
4. Completing the Construction	Student will describe how to perform the following tasks: a. Floor Finish 1. Tiles 2. Ceramics 3. Rugs and Carpets b. Screeding c. Edging and Jointing d. Floating e. Troweling	Feirer and Hutchings pp. 280 - 284 Practical Project Blueprints Demonstration Field Project Site Visitation Post-Test
5. Driveways, Sidewalks and Basement Floors	Student will demonstrate how to perform the following tasks: a. Driveways 1. Forming	Feirer and Hutchings pp. 284 - 287 Site Visitation Blueprints Demonstration

	2. Pouring Concrete 3. Finishing b. Sidewalks 1. Forming 2. Pouring 3. Finishing c. Basement Floor	Field Project Practical Project Post-Test
6. Estimating	Student will estimate quantity of materials required to complete a concrete a flatwork.	Feirer and Hutchings pp. 288 - 289 Blueprints Demonstration Post-Test
E. Concrete Forms	Student will identify the basics of concrete forming and will prepare forms for the following jobs according to specifications: a. Footing b. Foundations c. Columns d. Door and Window Openings e. Beams f. Roof Slab g. Retaining Walls	Micronesian Construction Manual, TTPI 1973 pp. 68 - 69 Feirer and Hutchings pp. 231 - 234 Demonstration Practical Project Field Work Post-Test
1. Estimating	Student will estimate quantity of materials required to complete forming jobs in construction.	Feirer and Hutchings pp. 245 - 246 Classwork and Assignments Blueprints Post-Test
F. Steel Reinforcements	Student will explain the basics of concrete reinforcements and will safely perform the following:	Micronesian Construction Manual, 1973 pp. 70 - 88 Blueprints

	a. Floor Reinforcement b. Roof Slab Reinforcement c. Column Reinforcement d. Beam Reinforcement e. CMU Reinforcement f. Retaining Wall Reinforcement	Demonstration Post-Test
1. Estimating	Student will estimate correct amount of steel reinforcement for a given project.	Micronesian Construction Manual, 1973 pp. 74 - 75 Classwork and Assignments Post-Test

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UNIT IV: Framing

Major Objective: After completing this framing unit the student should be able to frame a house from the floor up to the roof. This will also enable the student to find a job as a carpenter's helper in the field of construction in the state of Truk. This unit is complicated; therefore the student enrolling in this unit "MUST" have completed all the basic carpentry units. Individual projects to test skills before moving on is very important.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to perform the following framing tasks at a job-entry level.	
A. Roof Framing	Student will perform roof framing tasks according to plans.	Demonstration Practical Project
1. Roof Styles	Student will recall the various roof styles.	Feirer and Hutchings pp. 411 - 412
2. Roof Framing Terminology	Student will memorize the most commonly used terminology in the area of roof framing.	Feirer and Hutchings pp. 412 - 416 Pre-Test Nomenclature Chart Post Test
3. Laying Out the Roof Plan	Student will lay out a roof plan based on the details in the working drawing	Feirer and Hutchings pp. 416 - 418 Blueprints Post-Test
B. Framing with Common Rafters	Student will frame a house using common rafters.	Feirer and Hutchings pp. 419 - 429 Post-Test

1. Pythagorean Method	Student will calculate the length of common rafter using the Pythagorean method.	Feirer and Hutchings pp. 421 - 422 Practical Project Post-Test
2.Unit Length Method	Student will calculate the length of common rafters using the unit length method. The unit length is given on the framing square.	Feirer and Hutchings p. 422 Practical Project Demonstration Post-Test
3. Step-Off Method	Student will calculate and measure the length of common rafters using a step-off method.	Feirer and Hutchings p. 423 Demonstration Post-Test
4. Cutting Common Rafters	Student will cut a common rafter which includes deductions for building parts (e.g. ridge deductions) to the appropriate length.	Feirer and Hutchings pp. 423 - 424 Demonstration Practical Project Post-Test
5. Overhang	Student will calculate the correct length and cut the tail or the overhang to meet the specifications.	Feirer and Hutchings pp. 424 - 426 Demonstration Post-Test
6. Cheek Cut or Birth's Mouth	Student will identify the function of this cut and will be able to cut it to specifications.	Feirer and Hutchings pp. 426 - 427 Demonstration Post-Test
C. Hip and Valley Rafters	Student will demonstrate how to frame a roof which involves both hip and valley rafters.	Feirer and Hutchings pp. 430 - 446 Post-Test

1. Hip Rafter Layout	Student will layout a hip roof according to the specification of a given project. (student should know the Framing Square)	Feirer and Hutchings pp. 430 - 437 Framing Square Demonstration Post-Test
2. Valley Rafter Layout	Student will layout a valley rafter on a roof according to specification. (student should use the Framing Square)	Feirer and Hutchings pp. 438 - 446 Framing Square Demonstration Post-Test
D. Jack Rafters	Student will recall the purpose of all jack rafters and will be able layout and cut to length.	Feirer and Hutchings pp. 447 - 450 Post-Test
1. Types of Jack Rafters	Student will identify the various types of jack rafters and their purposes: a. Hip Jack b. Valley Jack c. Cripple Jack	Feirer and Hutchings pp. 447 - 450 Demonstration Framing Square Practical Project
E. Layout and Erection of the Roof Frame	Student will be able to perform the following roof framing tasks as required in the carpentry trade: a. Layout ridgeboard b. Layout rafter locations c. Erect ridgeboard d. Erect the rafters	Feirer and Hutchings pp. 451 - 461 Demonstration Site Visitation Practical Project Community Work Post-Test
1. Collar Beam Framing	Student will install a collar beam employing the "Western" method as well as the "Traditional" method.	Feirer and Hutchings pp. 461 - 462 Demonstration Guest Lecture by Elders Post-Test

2. Gable-End Framing	Student will frame a gable-end of a house.	Feirer and Hutchings pp. 462 - 463 Demonstration Post-Test
3. Shed Roof	Student will frame a she roof house (This is a commonly used type of framing)	Feirer and Hutchings pp. 466 - 467 Demonstration Post-Test
4. Framing Flat or Low-Pitch Roof	Student will frame a building which requires a lean-to-flat roof.	Feirer and Hutchings pp. 469 - 472 Demonstration Post-Test
5. Estimating	Student will estimate amount of materials needed for a given roof job.	Feirer and Hutchings pp. 475 - 478 Blueprints Post-Test
F. Roof Trusses	Student will identify the purpose of the roof trusses and and will assemble trusses.	Feirer and Hutchings pp. 479 - 499 Post-Test
1. King-Post Truss	Student wil construct a king-post truss according to specifications.	Feirer and Hutchings pp. 481 - 484 Practical Project Demonstration
2. W-Type Truss	Student will construct a w-type truss according to specifications (This is the most commonly used truss in Micronesia).	Feirer and Hutchings p. 484 Blueprints Practical Project Demonstration

3. Scissors Truss	Student will construct a scissors truss according to specifications.	Feirer and Hutchings p. 484 Practical Project Demonstration
4. Gussets	Student will design and cut plywood gussets according to the given specifications. Student will prepare nailing schedule for each gusset.	Feirer and Hutchings pp. 486 - 487 Layout Gussets on a Whole Sheet of Plywood Demonstration Post-Test
5. Selecting Truss Design	Student will select a right truss design for a given job. Student will recall the strength and weaknesses of each truss.	Feirer and Hutchings pp. 488 - 492 Practical Project Demonstration
6. Truss Assembly	Student will design a jig to be used for assembling the various types of trusses.	Feirer and Hutchings pp. 493 - 496 Design a Model Jig for Model Trusses Demonstration
7. Truss Erection	Student will formulate a safe truss mounting and anchor it to the building (Traditional order of erecting roof members will be explained by the instructor).	Feirer and Hutchings pp. 496 - 497 Site Visitation Post-Test Demonstration Post-Test
8. Anchor	Student will anchor trusses safely to both wooden frame structure, CMU strucuture and metal frame structure.	Blueprints to be Provided by the Instructor

9. Estimating	Student will estimate amount of materials used for each truss and enough for a whole structure.	Feirer and Hutchings pp. 497 - 499 Blueprints Classwork and Assignments Post-Test
G. Roof Sheathing	Student will identify the purpose of roof sheathing and will be able to install it if required by a job. (This lesson will only be stressed if time permits. Very few if any buildings in Truk require roof sheathings)	Feirer and Hutchings pp. 500 - 514 Blueprints Various Magazines Demonstration Post-Test
H. Roof Covering	Student will distinguish the various types of roof covering and will be able to apply them according to plans.	Feirer and Hutchings pp. 515 - 557 Blueprints Post-Test
1. Roofing Terminology	Student will recall the varioud terminology as related to roofing.	Feirer and Hutchings pp. 516 - 517 Post-Test
2. Roofing Accesories	Student will identify different accesories required for roofing. Student will know the specific accesories required for the State of Truk and FSM.	Feirer and Hutchings pp. 517 - 526 Blueprints Demonstration Post-Test
3. Asphalt Shingles	Student will install asphalt shingles according to plans (Asphalt singles are rarely used in the State of Truk, however students who anticipate working in the United States must know how to install shingles).	Feirer and Hutchings pp. 527 - 534 Reading Assingments to be Selected by the Instructor Demonstration Post-Test

4. Wood Shakes	Student will identify the three different types of wood shakes and will be able to install them according to plans. (Although very expensive, this type of roofing material will withstand the salt-spray which often destroys commonly used roofing tin).	Feirer and Hutchings pp. 534 - 540 Blueprints Demonstration Guest Lecturers Post-Test
5. Wood Shingles	Student will list different types of wood shingles and will be able to apply them according to plans.	Feirer and Hutchings pp. 540 - 541 Demonstration Post-Test
6. Roll Roofing	Student will identify roll roofing material and will install it according to plans.	Feirer and Hutchings p. 544 Demonstration Post-Test
7. Metal Roofing	Student will describe the different characteristics of this most commonly used roofing material in the State of Truk. Student will install corrugated sheet metal roofing.	Feirer and Hutchings pp. 546 - 550 Demonstration Post-Test
8. Purlins	Student will locate purlins in the right place to safely support corrugated sheet metal roofing.	Lecture by Instructor Demonstration Blueprints Post-Test
9. Gutters and Downspouts	Student will identify the purposes of gutters and downspouts and will install them according to plans.	Feirer and Hutchings pp. 550 - 554 Demonstration Post-Test

10. Estimating	Student will estimate correct amount of materials for a roofing job. (Emphasis will be placed on estimating purlins and corrugated sheet metal roofing)	Feirer and Hutchings pp. 554 - 556 Blueprints Post-Test
I. Roof Trim	Student will examine the purpose of roof trim and will install roof trim according to plans. [Emphasis will be placed on fascia board (This is the most commonly used roof trim in Micronesia)]	Feirer and Hutchings pp. 559 - 583 Demonstration Practical Project Post-Test
J. Window Framing	Student will review the purpose of window framing and will prepare window frames according to specifications.	Feirer and Hutchings pp. 584 - 623 Blueprints Post-Test
1. Types of Windows	Student will recognize the various types of windows and will prepare rough and finish frames for each window.	Blueprints Door and Window Schedules Hardware Store Visitation Post-Test
2. Parts of Window Frames	Student will recognize the various types of window frames especially the louver type of window which is commonly used in the State of Truk.	Blueprints Nomenclature Chart Models Demonstration
3. Estimating	Student will estimate correct amount of materials required to frame a complete door job.	Blueprints Door and Window Schedule Post-Test
K. Door and Door Framing	Student will distinguish the various types of doors and will be able to construct frames according to specifications.	Feirer and Hutchings pp. 624 - 660 Door and Window Schedules Demonstration Models

1. Types of Doors	Student will identify the different types of doors including the locally produced ones.	Feirer and Hutchings pp. 624 - 632 Door Chart Hardware Store Visitation Post-Test
2. Installing Frames	Student will install door frames according to specifications.	Feirer and Hutchings pp. 632 - 640 Demonstration
3. Fitting a Door	Student will fit a door correctly according to specifications.	Feirer and Hutchings pp. 641 - 644 Demonstration
4. Hanging a Door	Student will hang a door according to specific project specifications.	Feirer and Hutchings pp. 645 - 649 Demonstration on How to Install Various Hinges.
5. Installing Lockset	Student will install lockset according to manufacturer's specifications and specific job requirements.	Feirer and Hutchings pp. 649 - 656 Demonstration Manufacturers Specs. Post-Test
6. Estimating	Student will estimate the amount of materials required for a complete door installation job.	Door and Window Schedule Blueprints Feirer and Hutchings p. 659 Post-Test
L. Stairs	Student will identify the basic principles of stairs and will be able to frame a simple single-flight stair according to plan and specifications.	Feirer and Hutchings pp. 829 - 858 Demonstration Practical Project Post-Test

1. Parts of Stairs	Student will be able to recognize the various parts of stairs as depicted in the working drawing.	Feirer and Hutchings pp. 831 - 832 Guest Lecture Site Visitation Practical Project Nomenclature Chart Blueprints Post-Test
2. Framing Stairwell	Student will identify the purpose of a stairwell and will prepare an opening through the floor for the stairs.	Feirer and Hutchings pp. 832 - 833 Demonstration Practical Project Post-Test
3. Designing a Stairway	Student will design a stairway to meet specifications called for in a working drawing.	Feirer and Hutchings pp. 833 - 838 Practical Project Blueprints Demonstration Post-Test
4. Laying out a Stairway	Student will layout a stairway according to plans. Student will be able to layout a stairway both in and out of a building.	Feirer and Hutchings pp. 838 - 842 Demonstration Practical Project Post-Test
5. Stringers	Student will layout, cut and erect stringers according to plans.	Feirer and Hutchings pp. 842 - 852 Demonstration Practical Project Post-Test
6. Estimating	Student will estimate the amount and number of materials required to complete a stairway.	Feirer and Hutchings pp. 855 - 857 Classwork Post-Test

UNIT V: Finishing Carpentry

Major Objective: After completing this unit the student will be able to perform most of the finish carpentry work necessary to complete a residential unit. Student will learn the essentials in using various manufactured finishing materials as well as locally produced materials. Hands on experience is a must for all students enrolled in this finish carpentry course.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to perform the necessary finish carpentry skills at the job entry level.	
A. Sound Insulation	Student will list the principles of sound control and will be able to install sound control materials according to plans.	Carpentry and Building Construction. John L. Feirer and Gilbert Hutchings (Authors). pp. 724 - 733 Reading Assignments
1. Sound Insulation Wall Construction	Student will review the purpose and will construct sound a proof wall.	Feirer and Hutchings pp. 725 - 729 Shop Project and Assignments Post-Test
2. Sound Insulation in Floor-Ceiling Construction	Student will learn to construct a sound-proof wall and ceiling.	Feirer and Hutchings pp. 729 - 733 Shop Project and Assignments Post-Test
B. Interior Wall and Ceiling Finish	Student will list the principles of finish walls and ceilings and the various materials used for its construction.	Feirer and Hutchings pp. 735 - 780 Reading Assignments Post-Test

1. Lath and Plaster	Student will inspect completed walls and ceilings using lath and plaster. (Though these materials are not commonly known or used in Truk it is important for the student who will eventually leave Truk to find jobs elsewhere).	Feirer and Hutchings pp. 735 - 740 Reading Assignments Shop Project Site Visitation if Applicable Post-Test
2. Dry Wall	Student will examine the principles of dry wall materials and will use them according to plans. (See note on the above).	Feirer and Hutchings pp. 740 - 749 Shop Project and Assignments Post-Test
3. Plywood	Student will review the principles of plywood paneling and will install plywood panels according to plans. (This material commonly used in the State of Truk).	Feirer and Hutchings pp. 749 - 762 Shop Project and Assignments Post-Test
4. Hardboard and Fiberboard	Student will apply knowledge of safe handling to these materials and will be able to install them on a building according to plans. (These are commonly used materials in the State of Truk)	Feirer and Hutchings pp. 762 - 764 Shop Project and Assignments Post-Test
5. Wood Paneling	Student will review the principles of wood paneling and will install both the horizontal as well as vertical wood panels according to plans.	Feirer and Hutchings pp. 764 - 773 Shop Project and Assignments Post-Test
6. Bathroom Wall Covering	Student will study the principles of bathroom wall covering and will be able to install appropriate materials according to plans. This includes concrete as well as wooden framed homes.	Feirer and Hutchings pp. 773 - 776 Site Visitation Hands-On Projects Post-Test

7. Estimating	Student will estimate the amount of materials for a given project according to plans and specifications.	Feirer and Hutchings pp. 776 - 780 Classwork and Assignments Post-Test
C. Ceiling Tile and Suspended Ceilings	Student will identify the principles for installing ceiling tiles and suspended ceilings and will be able to install both materials according to the specifications and manufacturers technical manual.	Feirer and Hutchings pp. 780 - 799 Reading Assignments Site Visitation Post-Test
1. Ceiling Tile	Student will analyze all different ceiling tiles and will install them according to plans and specifications.	Feirer and Hutchings pp. 781 - 790 Shopwork and Assignments Post-Test
2. Suspended Ceiling	Student will distinguish between different types of suspended ceilings and will be able to complete a ceiling job according to plans and specifications.	Feirer and Hutchings pp. 790 - 795 Shopwork and Assignments Post-Test
3. Estimating	Student will estimate the amount of materials required for a given project.	Feirer and Hutchings pp. 795 - 798 Shopwork and Assignments Post-Test
D. Finish Flooring	Student will list the principles of finish flooring and will completet a floor job according specifications. Student will be able to distinguish and and install the following finished floor product: 1. Hardwoood Strip Flooring 2. Varnish, Shellac and Lacquer 3. Linoleum 4. Asphalt Tiles	Feirer and Hutchings pp. 799 - 829 Classwork and Assignments Post-Test

E. Stairs	Student will examine and inspect the different types of stairs and will be able to finish a stair based on the specifications. (This lesson can be accomplished in the framing lesson).	Feirer and Hutchings pp. 829 - 858 Shopwork and Assignments Site Visitation Post-Test
F. Cabinets and Built-Inn	Student will identify the purpose of cabinets and will be able install built-in cabinets as well as construct new ones according to plans and specifications.	Feirer and Hutchings pp. 858 - 898 Shopwork and Assignments Post-Test
1. Kitchen Cabinet Dimensions	Student will recognize various standard cabinet specifications and will be able to install the cabinets or build new ones according to plans.	Feirer and Hutchings pp. 860 - 861 Shopwork and Specifications Post-Test
2. Kitchen Cabinet Construction	Student will practice constructing commonly-used cabinets according to plans.	Feirer and Hutchings pp. 862 - 880 Shopwork and Assignments Individual Projects Post-Test
3. Bathroom Cabinets and Countertops	Student will identify basic skills required for these commonly done projects and will be able to complete such projects according to plans and specifications.	Feirer and Hutchings pp. 881 - 888 Shop Projects Post-Test
4. Linen Closets and China Cases	Student will distinguish between the two and will be able to build both the linen closets and china cases according to plans.	Feirer and Hutchings pp. 888 - 896 Shop Projects Post-Test

G. Interior Trim	Student will identify the purpose of the interior trim and will be able to finish the interior trim of a house. Student will also be able to install the following trims: 1. Molding 2. Door and Window Casing 3. Guards 4. Drip Caps 5. Door and Window Stops	Feirer and Hutchings pp. 899 - 950 Shop Project School Repair Site Visitation Post-Test
H. Interior Painting and Finishing	Student will inspect an interior of a house ready for varnishing and/or painting. Student will employ various painting devices, namely: 1. Paint Brush 2. Paint Rollers 3. Spray Gun	Feirer and Hutchings pp. 951 - 966 School Repair Shop Projects Site Visitation Post-Test
I. Exterior Painting	Student will demonstrate how to get the exterior of a building ready for painting and will also learn how to paint the exterior of a house properly. Student will select proper paint that is both suitable and safe. (Many Trukese use water catchments and therefore the issue of lead poisoning must be addressed)	Feirer and Hutchings pp. 967 - 982 School Repair Shop Projects Site Visitation Health Speaker Post-Test

UNIT VI: Estimating

Major Objective: After completing this unit the student will be able to complete a bill of materials for a given carpentry project. Student will, with the aid of the instructor, estimate and complete a bill of materials for a single unit residential home. (Working drawings will be provided by the instructor for the student's use.

INSTRUCTIONAL CONTENT	COGNITIVE AND PERFORMANCE ACTIVITIES	INSTRUCTIONAL AIDS/METHODS
	Upon completing this unit the student will be able to prepare a complete estimate of a single-unit residential home with 80% accuracy.	
A. Girders	Student will estimate the quantity of lumber required to complete girders for a house.	Practical Problems in Mathematics for Carpenters Harry Huth (Author, 1979) pp. 141 - 143 Classwork and Assignments Blueprints Post-Test
B. Sills	Student will estimate the quantity of lumber required to complete sills for a complete house.	Mathematics for Carpenters pp. 143 - 144 Classwork and Assignments Blueprints Post-Test
C. Floor Joists	Student will estimate the quantity of lumber required to complete floor joists for a complete house.	Mathematics for Carpenters pp. 145 - 147 Classwork and Assignments Blueprints Post-Test

D. Bridging	Student will estimate the quantity of lumber required to complete all the bridging work for a complete house.	Mathematics for Carpenters pp. 148 - 149 Classwork and Assignments Blueprints Post-Test
E. Rough Flooring	Student will estimate the quantity of boards and/or plywood required to complete a sub-floor of a complete house. (Note: In Truk, the sub-floor is always the finished floor).	Mathematics for Carpenters pp. 150 - 151 Classwork and Assignments Visit to Lumber Yard Blueprints Post-Test
F. Studs and Fire Stops	Student will estimate the quantity of lumber required to complete studs and fire stops for a complete house.	Mathematics for Carpenters pp. 152 - 153 Classwork and Assignments Blueprints Post-Test
G. Wall Plates (Sole and Top)	Student will estimate the quantity of lumber required for sole and top plates for a complete house.	Mathematics for Carpenters pp. 154 - 155 Classwork and Assignments Blueprints Post-Test
H. Rafters	Student will estimate the quantity of lumber required to complete the following rafters in a complete house: 1. Common Rafters 2. Hip Rafters 3. Valley Rafters 4. Hip Jack Rafters 5. Valley Jack Rafters 6. Cripple Jack Rafters	Mathematics for Carpenters pp. 156 - 159 Classwork and Assignments Roof Plans Guest Lecturer Various Blueprints Post-Test

I. Ridgeboard	Student will estimate the quantity of lumber required to complete the ridge of a complete house.	Blueprints Classwork and Assignments Roof Plans Post-Test
J. Sheathing	Student will estimate the amount of boards and/or plywood required to complete sheathing for a complete house. (Note: In Truk sheathing is always the finished wall)	Mathematics for Carpenters pp. 160 - 161 Classwork and Assignments Blueprints Post-Test
K. Siding	Student will estimate the amount of boards and/or plywood required to complete siding for a complete house.	Mathematics for Carpenters pp. 162 - 164 Classwork and Assignments Blueprints Post-Test
1. Tin Siding	Student will estimate the sheets of corrugated tin to complete sidings of a typical Trukese Home.	Blueprints Store Visitation Classwork and Assignments Post-Test
L. Trim	Student will estimate the amount of boards and/or manufactured trims to complete a trimming of a complete house.	Mathematics for Carpenters pp. 165 - 166 Classwork and Assignments Blueprints Post-Test
M. Purlins	Student will estimate the quantity of lumber to complete the purlins and roof nailers for a complete house.	Blueprints Classwork and Assignments Post-Test
N. Roofing Materials	Student will estimate the quantity of materials to complete a roof job of a complete house.	Mathematics for Carpenters pp. 167 - 168 Classwork and Assignments Blueprints Post-Test

O. Ridge Caps	Student will estimate the quantity of materials to complete the ridge cap of a complete house.	Blueprints Classwork and Assignments Post-Test
P. Doors and Windows	Student will estimate the quantity of materials needed to complete the door and window jobs of a building. Student will estimate the following: 1. Louver Windows 2. Double Hung 3. Awning 4. Sliding 5. Hopper 6. Casement 7. Solid Core Doors 8. Hollow Core Doors	Mathematics for Carpenters pp. 169 - 172 Blueprints Door and Window Schedule Classwork and Assignments Nomenclature Chart of Doors and Windows Post-Test
Q. Stairs and Door Jambs	Student will estimate the amount of materials to complete the stairs and door jambs of a complete house. (Note: Also refer to the unit on framing).	Mathematics for Carpenters pp. 172 - 173 Classwork and Assignments Door Schedule Blueprints Post-Test
R. Finish Flooring	Student will estimate the amount of materials to complete the finished floor of a house (Note: In Truk this will always mean the Asphalt and/or Vinyl Tiles).	Mathematics for Carpenters pp. 174 - 175 Classwork and Assignments Store Visitation Blueprints Post-Test
S. Hardware and Supplies	Student will estimate the amount of hardware and supplies needed to complete all the required parts of a complete house.	Mathematics for Carpenters pp. 176 - 177 Classwork and Assignments Blueprints Post-Test

T. Concrete	Student will estimate the amount of materials required to complete all the concrete work of a complete house.	Blueprints Note: Refer to the Unit on Cement and Concrete Classwork and Review
U. Paints	Student will estimate the amount of paint needed to paint a complete house.	Blueprints Paint Schedule as part of a working drawing

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